

Exhibit I



Entergy Services, Inc., on behalf of Entergy Arkansas, Inc.



Supplemental Information
Analysis of Reasonable Progress
Arkansas Regional Haze Program
First Planning Period

Submitted to:

Arkansas Department of Environmental Quality (ADEQ)
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1. INTRODUCTION

This report provides an update to the monitoring information originally provided by Entergy Arkansas, Inc. (EAI) and Trinity Consultants (Trinity) on August 7, 2015,¹ which was updated on November 15, 2016,² and September 27, 2017³. As of the September 27, 2017 update, only data for the first half of 2016 was available. Raw monitoring (“observed”) data for all months of 2016 are now available and are summarized herein. This report provide supplemental information only. The previous reports should be reviewed for explanations of how the raw data was summarized, how the deciview metric is calculated, and other background information.

Additionally, this report provides site-specific control cost estimates developed by Sargent & Lundy (S&L) for the Independence Steam Electric Station (Independence). These costs can be compared to the cost values developed by EPA for the FIP, the costs used by ADEQ for the SIP, and the costs that were presented – revised to reflect a 9-year equipment life – in the September 27, 2017 report.

¹ Trinity Consultants, *Regional Haze Modeling Assessment Report – Entergy Arkansas, Inc. – Independence Plant* (August 7, 2015) (Trinity Project No. 154401.0074), submitted as an Exhibit C to Entergy Arkansas, Inc.’s *Comments On the Proposed Regional Haze and Interstate Visibility Transport Federal Implementation Plan for Arkansas*.

² Trinity Consultants, *Assessment of Recent Class I Area IMPROVE Monitoring Data* (November 15, 2016) (Trinity Project No. 163701.0059).

³ Trinity Consultants, *Analysis of Reasonable Progress - Arkansas Regional Haze Program - First Planning Period* (September 27, 2017) (Trinity Project No. 173702.0014).

2. UPDATED IMPROVE MONITORING DATA

The most recent summary of annual monitoring data available from IMPROVE for CACR and UPBU has been completed through the year 2015. As of the date of this report, non-summarized data through December 31, 2016, is available and can be used to calculate the light extinction coefficients and haze indices for 2016. Trinity obtained the non-summarized data and compiled an independent summary for 2016. The species-specific and total light extinction and haze index values for the averages of the 20 percent worst days⁴ and the 20 percent best days for 2016 are shown in Table 2-1.

Table 2-1. Independent Summary of Monitoring Data for 2016

Light Extinction Value (Mm ⁻¹)	20 Percent Worst Days Average		20 Percent Best Days Average	
	CACR	UPBU	CACR	UPBU
Sulfate	31.32	31.42	5.64	5.99
Nitrate	14.15	17.25	0.98	1.21
Organics	17.18	16.74	2.59	2.64
Carbon	3.11	3.38	0.41	0.44
Soil	2.64	2.34	0.11	0.11
Coarse PM	6.17	6.41	1.31	1.39
Sea Salt	1.07	0.76	0.08	0.07
Total Light Extinction (Mm ⁻¹)	70.08	70.12	25.31	26.32
Haze Index (dv)	19.35	19.33	9.07	9.56

Table 2-2 presents a summary of the annual-average haze index values for each year from 2002 to 2016.

⁴ The revised Regional Haze Rule published on January 10, 2017, changed the definition of the “most impaired days” but is only applicable to the second and subsequent planning periods. Accordingly, this report uses the definition of the most impaired days that is applicable to the first planning period.

Table 2-2. Summary of Annual Average Haze Index Values from 2002 through 2016

Year	20 Percent Worst Days Average		20 Percent Best Days Average	
	CACR	UPBU	CACR	UPBU
2002	27.21	26.74	11.88	12.83
2003	26.54	27.22	10.74	10.62
2004	25.34	25.58	11.11	10.74
2005	29.21	30.47	12.93	13.34
2006	25.68	25.42	12.51	13.00
2007	-- ^A	26.17	-- ^A	12.45
2008	23.70	24.60	9.24	10.49
2009	22.68	22.62	8.09	9.40
2010	22.94	-- ^A	10.76	-- ^A
2011	22.67	23.21	11.71	11.51
2012	21.49	21.56	9.54	10.31
2013	21.35	21.25	8.61	8.60
2014	20.72	20.49	8.52	8.13
2015	20.41	19.96	7.03	7.50
2016	19.35	19.33	9.07	9.56

^A Summarized data are not available for CACR for 2007 and UPBU for 2010.

Figure 2-1 and Figure 2-2 present, for CACR and UPBU, respectively, comparisons of the observed haze index values for each year of IMPROVE data, including independently summarized values from 2016, to the Uniform Rate of Progress (URP) line established for each area. The same comparisons are shown for the two Missouri Class I areas in Appendix A.

Figure 2-1. CACR Monitored Observations Compared to Uniform Rate of Progress

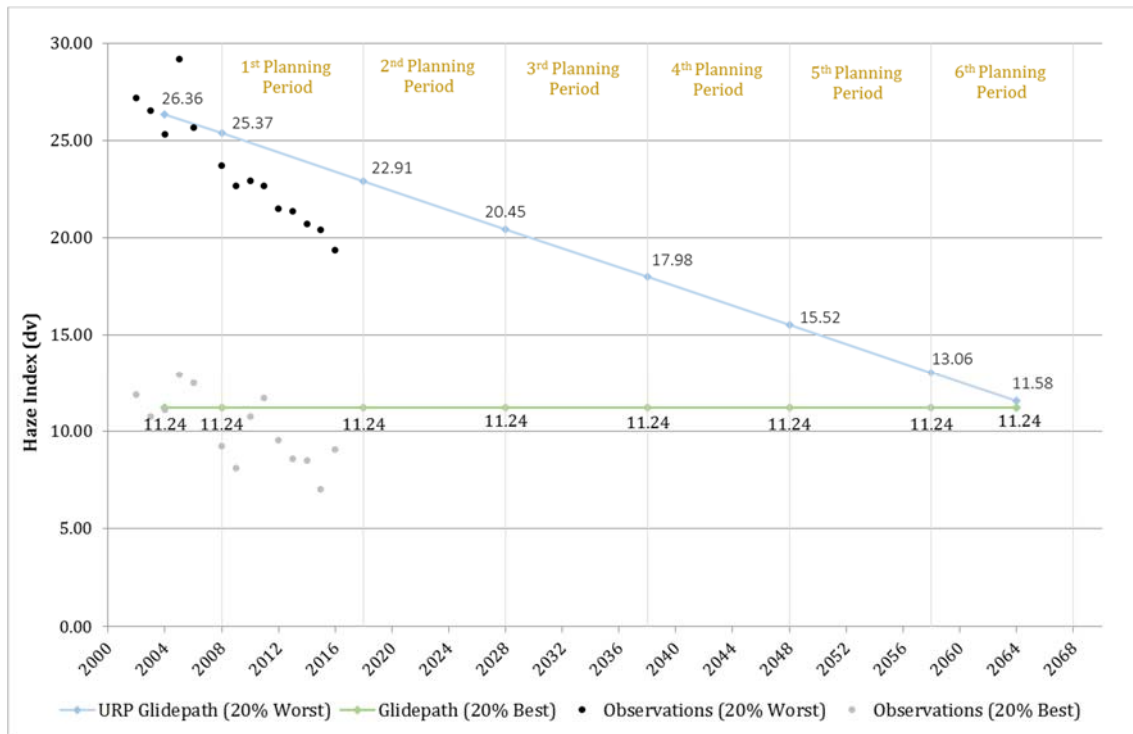
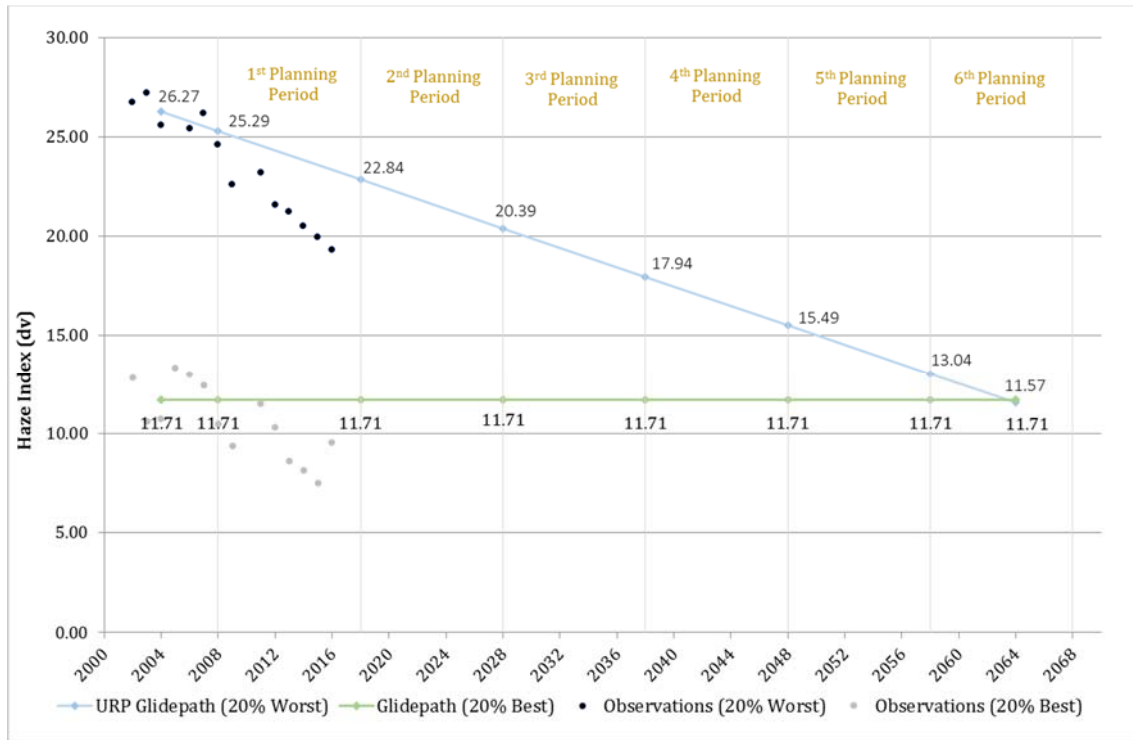


Figure 2-2. UPBU Monitored Observations Compared to Uniform Rate of Progress



As seen in the figures above, the actual observed visibility impairment at these Class I areas has declined sharply from 2002 through 2016 (the most recent available data). According to the monitor data, the current observed 20 percent worst days average haze index values are below the URP values for 2018 as well as the 2018 Reasonable Progress Goals (RPGs) that EPA set in the Arkansas Regional Haze Federal Implementation Plan,⁵ meaning that Arkansas has achieved more than is necessary to demonstrate reasonable progress for the first planning period. Table 2-3 presents a comparison of the 2016 observed values and the 2018 RPG values.

Table 2-3. 2016 Observed Haze Index Values Compared to 2018 URPs and RPGs

Class I Area	Observed 20 Percent Worst Days Average for 2016 (first half year)	RPG for 2018	Observed Value as % of RPG
CACR	19.35	22.47	86.1 %
UPBU	19.33	22.51	85.9 %

⁵ 81 Fed. Reg. 66,332 (September 27, 2016).

3. SITE-SPECIFIC COST INFORMATION FOR INDEPENDENCE

Site-specific control cost estimates were recently developed by Sargent & Lundy (S&L) for Dry Flue Gas Desulfurization (DFGD) at Independence. Based on these estimates, the cost of compliance is more than \$6,600/ton for Unit 1 and more than \$6,100/ton for Unit 2. S&L’s detailed report is included in Appendix B of this report, and a summary is provided in Table 3-1, below. Two sets of values are presented: “Actual” costs as estimated by S&L and “Adjusted” values based on S&L’s estimates after excluding cost items that EPA has historically claimed should not be accounted for in cost effectiveness calculations.⁶ Even using these adjusted costs, the cost of compliance would be more than \$5,000/ton for Unit 1 and more than \$4,600/ton for Unit 2.

Table 3-1. Summary of Site-Specific Control Cost Estimates – Actual and Adjusted Values

Actual Costs	Unit 1	Unit 2
Capital (\$)	491,893,500	491,893,500
Capital Recovery Factor ^A	0.1535	0.1535
Annualized Capital (\$/yr)	75,505,652	75,505,652
Annual O&M (\$/yr)	8,809,000	8,809,000
Total Annual Cost (\$/yr)	84,314,652	84,314,652
SO ₂ Emissions Reduction (ton/yr) ^B	12,608	13,655
Cost Effectiveness (\$/ton)	6,688	6,175
Adjusted Costs	Unit 1	Unit 2
Capital (\$)	355,391,500	355,391,500
Capital Recovery Factor ^A	0.1535	0.1535
Annualized Capital (\$/yr)	54,552,595	54,552,595
Annual O&M (\$/yr)	8,809,000	8,809,000
Total Annual Cost (\$/yr)	63,361,595	63,361,595
SO ₂ Emissions Reduction (ton/yr) ^B	12,608	13,655
Cost Effectiveness (\$/ton)	5,026	4,640

^A Based on a nine-year amortization period and 7 % interest.

^B EAI’s emissions reduction value differs from EPA’s value because of a difference in how the average baseline emissions were calculated. EAI simply averaged the five annual values for 2009-2013. EPA took a three-year average over the same time period after excluding the minimum and maximum values.

⁶ An example of an excluded cost is Allowance for Funds Used During Construction (AFUDC). AFUDC represents the interest expense incurred on the investment in a large capital project, such as a FGD installation, which can take several years to complete (≥ 5 years). Although interest expenses will certainly be incurred on such a project, and AFUDC is typically considered as part of the capital cost of such a project for standard accounting and rate-making purposes, EPA Region 6 has expressed concern with the inclusion of AFUDC and certain other costs. EAI disagrees and believes that determining the cost effectiveness of the control options must realistically reflect the actual cost of compliance. See EAI’s comments on the proposed FIP. Nonetheless, for completeness, this report shows a range of cost effectiveness both including AFUDC and other costs and excluding those costs.

APPENDIX A: OBSERVATIONS COMPARED TO UNIFORM RATES OF PROGRESS FOR MISSOURI'S CLASS I AREAS

Figure A-1. MING Monitored Observations Compared to Uniform Rate of Progress

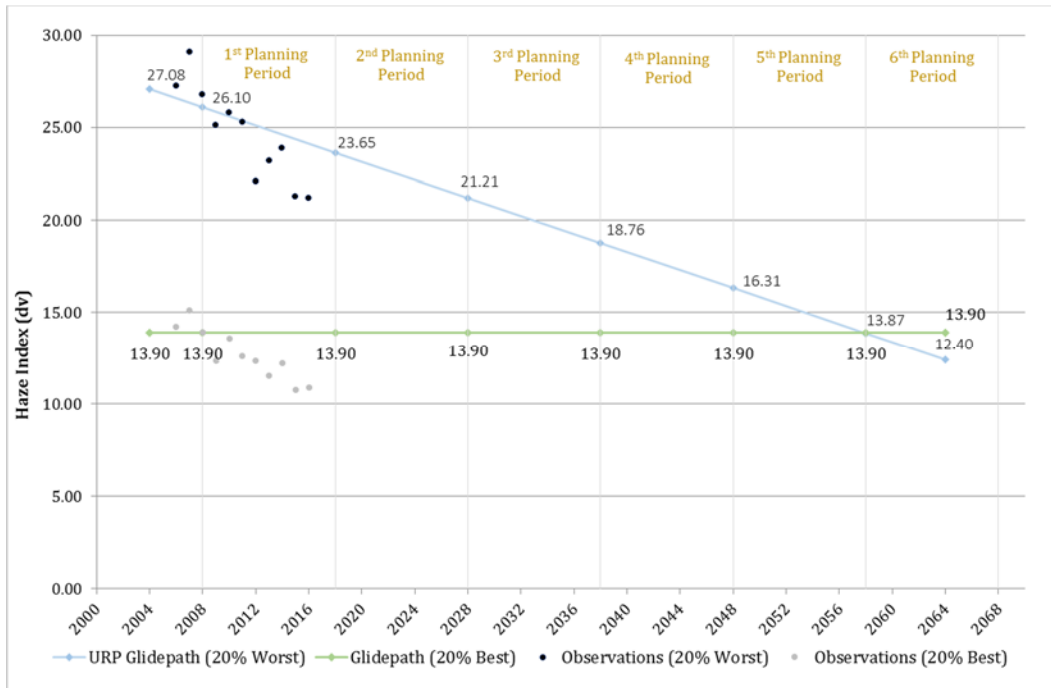
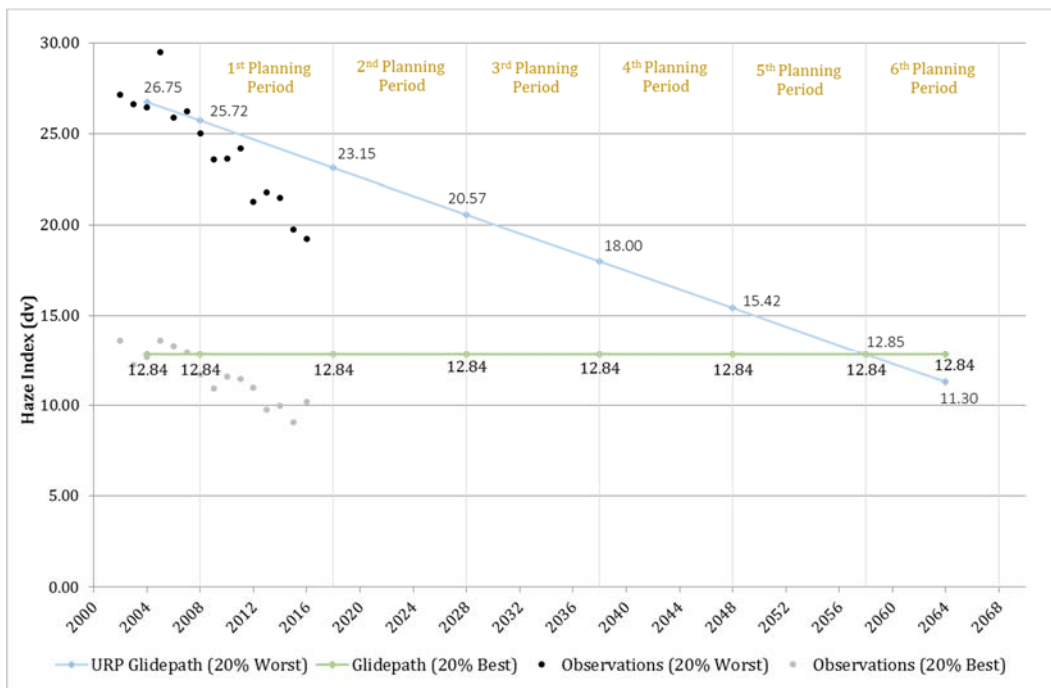


Figure A-2. HEGL Monitored Observations Compared to Uniform Rate of Progress



APPENDIX B: CONTROL COST INFORMATION



ENERGY ARKANSAS, INC.

**INDEPENDENCE DRY FGD
COST ESTIMATE AND TECHNICAL BASIS**

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Prepared by



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1. PURPOSE

The purpose of this study is to estimate the total capital investment and operating and maintenance costs associated with installing dry flue gas desulfurization (FGD) technology on Independence Units 1&2.

This report documents the conceptual design and technical basis for the dry FGD cost estimate.

2. TECHNOLOGY DESCRIPTION

2.1.1. Reagent Preparation System

Lime will be supplied to the lime day bins from the long-term storage silo located in the Reagent Handling Area and supplied by the EPC Contractor. The lime day bins, located in the Reagent Preparation Area and provided by the Dry FGD System Supplier, will each have a storage capacity to supply the plant with lime reagent for 24 hours when firing 1.2 lb SO₂/mmBtu coal.

Lime from the day bin will be gravity-fed through feeders to a lime slaker, where the lime will be slaked (mixed with low pressure service water and converted from calcium oxide to calcium hydroxide slurry). The plant will have a total of two lime slaking trains (2 x 100%), each sized to process enough lime slurry to supply the entire plant. Each lime slaker will discharge to a lime slurry transfer tank, which is equipped with two lime slurry transfer pumps which will feed into the lime slurry storage tanks. The common lime slurry storage tanks will each be sized for 12 hours of storage for the entire plant when burning a 1.2 lb SO₂/mmBtu coal. The lime day bin, slaking trains, and lime slurry tanks are sized to provide the necessary reagent slurry to both units simultaneously. The lime slurry tanks are built with cross-ties such that either slurry tank can feed either the Unit 1 or Unit 2 FGD systems.

A total of four lime slurry feed pumps (two per unit), each sized for 100% flow to one unit, will pump the lime slurry from the storage tanks to the SDAs through one of 2 x 100% piping loops, and return unused slurry back to the lime slurry storage tank. The closed-loop reagent supply line requires a flow velocity between 4-10 fps to avoid any solids buildup in the piping. Because of this, the pumping requirement is higher than the actual SDA requirement and must be sufficiently greater than the slurry flow that is pumped into the absorbers to allow the returning flow to remain above 4 fps.

2.1.2. Absorbers

Three absorbers, each treating 33⅓% of the flue gas are provided for each unit. Depending on the supplier and the type of atomizer normally used, there may be one rotary atomizer per absorber with a shared spare (B&W), three rotary atomizers per absorber with one or more shared spares (Alstom, basis of the estimate), or multiple dual-fluid atomizers with 15% shared spares (Siemens). The cost estimate includes contingency to capture the possibility of any of these designs.

2.1.3. Baghouse

Each SDA will be paired with a pulse-jet baghouse with a gross air-to-cloth ratio of approximately 3.2-3.4 ft/min. The filter bags in each baghouse are cleaned by pulses of compressed air. The air compressors will be 4 x 33% for the station and are included in the scope of the baghouse supplier.

2.1.4. Byproduct Recycle System

The reaction byproducts from the absorbers will be collected in the baghouses and a portion of the collected material will be recycled. The baghouse hoppers will be emptied through air lock feeders and pneumatically conveyed to two recycle day bins located in the Byproduct Recycle Area and supplied by the Dry FGD System Supplier, which are common for both units. The air-lock feeders are installed without a spare. One recycle day bin is located in the recycle train for each unit. The common byproduct recycle day bins (one per unit) provide 8-hours of storage when burning 1.2 lb SO₂/mmBtu coal.

Each byproduct recycle day bin is equipped with two recycle slurry preparation systems. The byproduct in each recycle day bin is gravimetrically conveyed to one of two systems where the byproduct is slurried with water (cooling tower blowdown). The byproduct recycle slurry is stored in one of four plant wide recycle slurry tanks, two per unit (combined 4-hour storage capacity).

Two recycle water make-up tanks are located in the recycle area. The recycled by-product slurry will be combined with fresh lime slurry for feed to the SDA atomizers. Recycle feed slurry pumps (4 x 100%, two installed per unit) will be used to transfer the recycle slurry from the recycle slurry tanks to the atomizers. In addition, all recycle feed lines are provided in a loop configuration as with the reagent

system, with a complete redundant loop to allow unhindered operation due to any pluggage of pumps or feed piping.

2.1.5. Reagent Handling System

The basis of the estimate is delivery of lime via hopper-bottom railcars with truck unloading as a backup. In order to accommodate rail delivery to the site, a new rail spur will be constructed from the existing track on the plant site for unloading. A trackmobile car positioner will position railcars, two at a time, in the enclosed delivery shed for unloading. A vacuum pneumatic system will unload the railcars into either of the two (2) lime storage silos. The lime storage silos will be sized for supply of reagent for 14 days of storage at full load when firing 1.2 lb SO₂/mmBtu coal. Lime from the long-term storage silos will be pneumatically transferred to two lime day bins located in the Reagent Preparation Area and supplied by the Dry FGD System Supplier.

2.1.6. Byproduct Handling System

Excess FGD byproduct from the recycle system will be pneumatically conveyed to either of the two common long-term FGD byproduct storage silos. The two long-term FGD byproduct storage silos are each sized to handle the byproduct for a total of 7 days of storage when firing the 1.2 lb SO₂/mmBtu coal. The byproduct will be mixed with a small amount of fly ash and water to form a final product which contains approximately 65% FGD byproduct, 5% fly ash, and 30% water. In order to achieve this mixture, a common fly ash blending bin (7-day storage) will be located near the new byproduct silos. The wetted byproduct/fly ash mixture is then loading into dump trucks, which will deposit the FGD byproduct in a final storage location in the landfill. It is assumed that the existing landfill will have sufficient capacity to accommodate the addition of FGD byproduct. Therefore no costs were included in the capital estimate for the (existing) landfill.

2.1.7. Flue Gas Handling System

The flue gas from the existing ID fans will be ducted to the absorbers. The gases from the absorbers will be ducted to the baghouses to collect the reaction by-products and residual fly ash. Two axial booster fans (2 x 50% for each unit) will be located downstream of the absorbers and baghouse; the booster ID

fans can be provided by the Dry FGD System Supplier or the EPC Contractor. Due to the dry condition of the scrubbed flue gas, the existing stack and liners will be used for the retrofit case.

2.1.8. Electrical BOP System

In order to feed the new dry FGD and other BOP equipment, significant modifications and additions to the existing power system would be required. These include, at a minimum, installation of new auxiliary transformers, medium- and low-voltage switchgear buses, motor control centers (MCCs) and upgrades to the isolated phase tap-off buses. As a detailed conceptual design was not developed an allowance was included for the Electrical BOP Scope.

2.1.9. I&C BOP System

The dry FGD system will be integrated into the existing DCS system. The baghouse will be controlled through a PLC and the ID booster fans will be integrated into the existing DCS system. As a detailed conceptual design was not developed an allowance was included for the I&C BOP Scope.

3. APPROACH

The project capital and O&M cost estimates are based on project-specific information, including:

- An engineer-procure-construct (EPC) contracting strategy with the Dry FGD technology supplier providing the main process equipment as a complete FGD Island.
- On-site disposal of Dry FGD byproduct using new ash handling equipment. The byproduct will be collected in the new fabric filter and blended with fly ash prior to disposal.
- Reagent injection rates based on achieving an outlet SO₂ emission rate of 0.06 lb SO₂/MMBtu from a design inlet concentration of 1.20 lb SO₂/MMBtu, based on the sulfur limit in the fuel supply contracts.
 - Annual operating costs will be based on an uncontrolled SO₂ rate of 0.49 lb SO₂/MMBtu, based on the annual heat input weighted average emission from 2009 through 2013.
 - The system will be designed to control emissions to meet a permit limit of 0.06 SO₂/MMBtu, based on the required permit limits in the EPA Arkansas FIP.

- A high level conceptual system design was used as input to the Dry FGD cost estimate. The following were estimated based on previous projects and scaled for the predicted dry sorbent injection rate for Independence:
 - Auxiliary power consumption
 - Annual reagent consumption
 - Equipment Sparing and Quantities
 - BOP Allowances (Mechanical, Electrical and I&C)

The total plant capital cost estimate includes the following:

- Equipment and material
- Installation labor
- Demolition and Relocation work
- Indirect field costs and BOP engineering
- Freight on Materials
- General and Administration
- Erection contractor profit
- Engineering, Procurement and Project Services
- Spare parts/initial fills (other than reagent)
- EPC Fee

As part of this project, S&L estimated the costs for Owner's services and costs outside of the EPC contract including the following:

- Owner's Costs
- Owner's Engineer
- Construction Management Support
- Startup and Commissioning Support
- Performance Testing
- Contingency
- Escalation
- Interest During Construction

Cost Estimate 34261 provided in Attachment 1 represents the total cost to Entergy to install Dry FGD technology on both units at Independence (Unit 1 and 2) including the EPC Contract price and all additional Owner's costs and third party services.

The total unit O&M cost estimate includes the following:

- Waste disposal (Dry FGD waste)
- Reagent consumption
- Auxiliary power consumption
- Water consumption for reagent and byproduct handling
- Operating labor
- Maintenance material
- Maintenance labor

The O&M Cost Estimate and Capital Cost Estimate were developed using the assumptions and scope provided in this document. The project definition and accuracy corresponds to a study level estimate as defined in U.S.EPA's Office of Air Quality Planning and Standards (OAQPS) Control Cost Manual. The costs provided in this report are in 2017 dollars.

4. CAPITAL AND O&M COST ESTIMATE TECHNICAL BASIS

4.1. DESIGN INPUTS AND ASSUMPTIONS

The following summarizes the design inputs used as the basis for the Independence dry FGD Systems:

- Design SO₂ inlet concentration of 1.2 lb SO₂/MMBtu for equipment design, based on the current coal contract sulfur limit.
- SO₂ inlet concentration of 0.49 lb SO₂/MMBtu for annual operating costs, based on the annual heat input weighted average emission from 2009 through 2013.
- Design SO₂ outlet concentration of 0.06 lb SO₂/MMBtu.
- Annual capacity factor of 75.0% (annual average capacity factor for Independence Units 1 and 2 based on historical heat input from 2009 through 2013).
- Project duration of five years.

4.2. TOTAL INSTALLED CAPITAL INVESTMENT

The Dry FGD System Supplier will provide all of the equipment within the FGD Island. The FGD Island will include the Reagent Preparation Equipment, Absorber Area Equipment, Baghouse Area Equipment and the Byproduct Recycle Equipment. The booster ID fans could be provided by either the Dry FGD System Supplier or the EPC Contractor; the basis of this estimate is supply of the booster fans by the Dry FGD System Supplier. The EPC Contractor will provide the remaining BOP scope in order to provide a complete and operable FGD system. In addition, the EPC Contractor will install/construct the entire system including the equipment provided by the DFGD supplier. The scope of work for the cost estimate is broken out by the following areas:

4.2.1. Dry FGD Island

- a. Reagent Preparation System, common to both units:
 - Two lime day bins, 24-hours storage each
 - Two detention lime slakers at 100% capacity, each with a grit screen, gravimetric feeder
 - Two lime slurry transfer tanks
 - Four slurry transfer centrifugal pumps
 - Two lime slurry storage tanks
 - Four slurry feed centrifugal pumps
 - Cost estimate based on budgetary proposal from Alstom; the budgetary proposal is based on a design sulfur of 2.0 lb/MMBtu, cost adjustments were included in the estimate for a lower design sulfur of 1.2 lb/MMBtu. These cost adjustments were developed by estimating the differential equipment cost for the reagent preparation and waste handling equipment. The impacted equipment is identified in Section 4.5 which discusses the sulfur design basis sensitivity.
- b. Absorber Area, per unit
 - Three absorber vessels per unit, with access doors
 - Rotary atomizers, two spare atomizers included
 - Vessel material carbon steel, 1/4 in. – 5/8 in. carbon steel
 - Heating and ventilation
 - Vacuum piping
 - SDA Superstructure
 - Cost estimate based on budgetary proposal from Alstom

- c. Baghouse Area, per unit
 - New baghouse, including pulse jet cleaning system and all appurtenances
 - Cost estimate based on budgetary proposal from Alstom
- d. Byproduct Recycle System, per unit (located remotely in common location for both units)
 - One recycle silo with bin vent filter per unit, 8-hour total capacity
 - Two recycle mix tanks per unit
 - Two recycle slurry tanks per unit, with two recycle slurry centrifugal pumps per unit
 - Agitators for each tank
 - Baghouse ash handling system common to both units
 - Rotary air-lock valves from baghouse hopper outlets to pressure pneumatic conveying system (60-degree typical)
 - Pneumatic pressure blowers (8 x 33 $\frac{1}{3}$ %)
 - Cost estimate based on budgetary proposal from Alstom
- e. ID Booster Fans, per unit
 - Two approximately 5,200 hp axial booster fans per unit sized to overcome pressure drop associated with FGD and baghouse
 - Includes motors - no spare motor included
 - Cost estimate based on budgetary proposal from Alstom
 - Dampers from ID fan to booster fans (cost estimated separately, not included in Alstom budgetary proposal)
- f. Interconnecting Ductwork, per unit
 - ID fan outlet to absorber inlet ductwork and supports; carbon steel, $\frac{1}{4}$ in, design velocity, 3,600 fpm
 - Absorber outlet to baghouse inlet ductwork and supports; carbon steel, $\frac{1}{4}$ in, design velocity, 3,600 fpm
 - Baghouse outlet to new booster fans and fan outlet to the stack inlet ductwork and supports; carbon steel, $\frac{1}{4}$ in, design velocity, 3,600 fpm

4.2.2. FGD Island BOP

- a. Absorber tower foundations including caissons
- b. Baghouse area foundations including 18" auger cast piles 60' long
- c. Booster fan area foundations
- d. Concrete foundations for all flue gas ductwork

- e. 6” insulation with lagging for Absorbers, Baghouses and Ductwork
- f. Penthouse enclosure for Absorbers located in FGD Island
- g. Two elevators (one for each unit) to provide maintenance access to Absorber and Baghouse Areas
- h. Enclosure around hoppers for Baghouses located in FGD Island
- i. Lime preparation building for Reagent Preparation Area in FGD Island, including substructure and superstructure
- j. Byproduct recycle building for Byproduct Recycle Area in FGD Island, including substructure and superstructure

4.2.3. Reagent Storage and Handling, common to both units:

- a. Lime rail car unloader:
 - Lime delivery via 25-car unit train
 - System consists of mobile receiving pan and associated vacuum pneumatic equipment to unload railcar through railcar bottom hoppers
 - Enclosed railcar unloading building
 - One vacuum pneumatic system operating to unload a car
 - Pneumatic vacuum exhausters (2 x 100%)
 - Filter separator with vacuum-to-pressure transfer hopper and valves
 - Cost estimate based on vendor quote for a similar unit
- b. Lime storage silos:
 - Two lime storage silos, (14-day capacity each, common to both units) with bin vent filter, including substructure and superstructure
 - 1,000-tons storage, each
 - Continuous level detection systems
 - Live bottom hopper outlets
 - Rotary airlock assemblies
 - Lime transfer systems:
 - Pressure pneumatic conveying system from lime storage silos to lime day bins
 - Pneumatic pressure blowers
 - One lot of pneumatic conveying piping located on an elevated pipe rack
- c. Concrete foundations including caissons for all material silos
- d. Concrete foundations for pneumatic conveying blowers and exhausters

4.2.4. Byproduct Handling System, common to both units

- a. Two FGD by-product storage silos (7-day capacity each, common to both units) with bin vent filter, fluidizing system, and two unloading conditioners (one operating, one spare per silo), including substructure and superstructure
- b. One common fly ash blending, 7-day storage bin with bin vent filter, fluidizing system, and four pneumatic airslide conveyors
- c. Water pumps and associated piping for unloading conditioners (pin mixers) at both silos
- d. Continuous level detection system
- e. Two truck scales and substructure
- f. Concrete foundations including caissons for all material silos
- g. Concrete foundations for pneumatic conveying blowers and exhausters
- h. Allowance for existing road improvements for truck haulage to existing landfill

4.2.5. Civil BOP

- a. Site grading
- b. Soil removal earthwork
- c. Excavation, backfill, and compaction for all foundations
- d. Development of a new laydown area, approximately 10 acres, including site preparation, fencing, and temporary power. It was assumed that this area would be located on existing plant property, and does not require land to be purchased.

4.2.6. Mechanical BOP System

- a. Interconnecting piping, above-ground and buried
- b. Valves for interconnecting piping, above-ground and buried
- c. Lime slaking water storage tank, 175,000-gallon capacity
- d. Recycle make-up water tanks, 2 x 200,000-gallon capacity
- e. Pipe Racks, common to both units
 - Between lime railcar unloading enclosure and lime silos
 - Between lime silos and lime day bins
 - From baghouse hoppers to recycle silos and FGD by-product silo
 - From lime slurry storage tanks to absorber
 - From recycle slurry storage tank to absorber
 - Concrete foundations including caissons for all pipe racks
 - Shallow concrete foundations for other miscellaneous structures

- f. BOP Pumps
 - Three by-product recycle water forwarding pumps to recycle slurry
 - Four reagent prep/recycle sump pumps
 - Two lime silo and unloading area sump pumps
 - Two by-product ash silo area sump pumps
 - Two by-product recycle make-up water tank supply pumps
 - Two lime slaking water pumps
- g. Instrument Air System, common to both units
 - Air compressors; 2 x 100%,
 - IA dryers w/filters; 2 x 100%,
 - Air receivers; 2 x 100%
 - Instrument air piping to every silo or day bin, bin vent and reagent preparation/recycle area
 - Heat-traced piping
- h. Service Air System, common to both units
 - Air compressors; 2 x 100%
 - Air receivers; 2 x 100%
- i. Field painting
 - Multiple coat system used for exposed ductwork only
 - Inorganic zinc primer and polyurethane system used for steel
 - Allowance for underground piping shop coatings built into piping cost

4.2.7. Demolition and Relocation

- a. Allowance of \$1,800,000, plus labor costs, is included for demolition and relocation of existing equipment and infrastructure which may interfere with the new Dry FGD system. This allowance is based on recent in-house cost estimates for similar projects.

4.2.8. Electrical BOP System

- a. Allowances of \$13,900,000, \$8,500,000 and \$1,400,000, plus labor costs, are included for electrical equipment upgrades and modifications, cables and conduits/raceway, respectively. These allowances are based on recent in-house cost estimates for similar projects.

4.2.9. Instrumentation and Controls BOP System

- a. Allowance of \$1,585,000, plus labor costs, is include for DCS upgrades and added instrumentation. This allowance is based on recent in-house cost estimates for similar projects.

4.2.10. Labor Costs

Installation/labor costs were included in the base estimate under the direct costs. Manhours are estimated for each item in the base estimate and are based on the type of work and typical estimates for similar work. The labor costs are based on the labor wage rates and labor crews developed by S&L.

a. Labor Wage Rates

Crew labor rates were developed using prevailing craft rates, fringe benefits and state specific worker's compensation rates as published in the 2017 edition of R.S. Means Labor Rates for Pine Bluff, Arkansas area. Costs were added to cover FICA, workers compensation, all applicable taxes, small tools, incidentals, construction equipment, and contractor's overhead. A 1.15 geographic labor productivity multiplier is included based on the Compass International Construction Yearbook for Arkansas. The crew rates do not include an allowance for weather related delays.

b. Labor crews

Construction/erection labor cost is based on the use of applicable construction crews typically required for projects of this type. The construction crew costs were specifically developed for utility industry and are proprietary to S&L. The prevailing craft rates are incorporated into work crews appropriate for the activities, and include costs for small tools, construction equipment, insurance, and site overheads.

4.2.11. Other Direct and Construction Indirect Costs

In addition to the base labor costs, other construction indirect costs for the project were broken out in the estimate as well as other contractor direct costs. The following items were included as other direct and construction indirect costs.

- a. Scaffolding and Consumables
- b. Premiums and per diems (\$10 per hour)
- c. Overtime is included based on five 10-hour shifts per week work schedule
- d. Freight on construction materials
- e. Contractor's General & Administration Fees (included at 10% of total direct and construction indirect costs)
- f. Contractor's Profit (included at 5% of total direct and construction indirect costs)

4.2.12. EPC Indirect Costs

The final contribution to the overall EPC project price are the EPC Contractor's indirect costs; these include the EPC engineering services, startup spare parts and initial fills, technical field advisors, and the EPC risk fee.

a. EPC Engineering Services

The EPC engineering services was estimated based on recent projects with similar scopes and schedules. The total cost of the EPC engineering services was estimated to be \$23,000,000.

b. Startup Spare Parts and Initial Fills

An allowance has been included for initial fills for equipment, including first fills for lubrication of any motorized equipment. The initial fill of pebble lime was not included in the EPC Contractor's scope, as this is considered to be an operating cost rather than a capital expense. The initial fill of pebble lime is included in the Owner's costs. The total cost of the initial fills was estimated to be \$300,000.

c. Technical Field Advisors (Vendors)

Allowances were included for equipment supplier's technical field advisory services based on an estimated 600 man-days. The estimate includes technical field advisors for the FGD system supplier (including FGD system subcontractors) and the DCS supplier. The total cost of the technical field advisors was estimated to be \$600,000.

d. EPC Risk Fee

An EPC approach provides an alternative which is expected to reduce risk for Entergy by placing the responsibility for the project on a single entity, the EPC Contractor. The EPC risk fee is a premium charged by the contractor which accounts for the additional coordination and management of the project as well as the additional risk assumed by the contractor. Based on S&L's experience with recent EPC projects, an EPC risk fee was included at 10% of the total EPC project costs.

4.2.13. Owner's Costs and Services

Outside of the EPC Contractor's total cost, Entergy will incur other costs associated with the project, such as services procured from third parties (including Owner's engineer, construction management support, startup and commissioning support and performance testing), and other project related costs.

a. Owner's Costs

Owner's Costs are direct costs that the Owner incurs over the life of the project. The following items are real costs Entergy will incur to install DSI at Independence based on the scope and schedule of this project:

- Internal Labor
- Internal Indirects

- Travel Expenses
- Legal Services
- Builders Risk Insurance
- Initial Fills (Reagent)

Owner's costs were included in the estimate at 8% of the total project cost.

b. Construction Management Support

The construction management support was estimated based on similar project scopes. It was assumed that Entergy will not have the internal support personnel required to perform the tasks, and therefore it will be outsourced. The cost of labor is based on present day cost. The total cost of the construction management support was estimated to be \$4,969,000.

c. Startup and Commissioning Support

The startup and commissioning support was estimated based on similar project scopes. It was assumed that Entergy will not have the internal support personnel required to perform the tasks, and therefore it will be outsourced. The total cost of the startup and commissioning support was estimated to be \$550,000.

d. Owner's Engineer

The Owner's Engineer cost was developed as a high level estimate based on a typical scope for Owner's Engineer work for this type of project; including the following tasks:

- Conceptual Study Support
- EPC Specification Supporting Documents
- Project Schedule Development
- EPC Specification Development
- EPC Bid Evaluation and Contract Conformance
- General Project Support
 - Monthly Project Status Meetings
 - Weekly Teleconferences
 - Overall Coordination
 - Project Administration
 - Site Visits and Travel
- Permitting Support
- Design Review of Drawing Submittals
- Technical support during design, fabrication, construction, commissioning, and testing

- Equipment vendor QA/QC audits

The total cost of the Owner's Engineer was estimated to be \$6,500,000.

e. Performance testing

The cost for performance testing was developed as a factored estimate using costs from projects of similar scope. This cost includes the testing, performed by a third-party contractor hired by the Owner, and also includes the cost for S&L's assistance in the following tasks:

- Development of the test protocol
- Procuring the services of the testing contractor
- Overseeing the performance test campaign
- Evaluating the results of the testing with respect to guarantee compliance

The estimate for the third party testing contractor is based on the assumption that the contractor would be onsite for up to 5 days. The total cost of the Performance Testing was estimated to be \$275,000.

f. Contingency

Contingency is included in the estimate to cover the uncertainty associated with the project costs. The cost estimate includes a recommended contingency of 15% (due to a greater extent of project definition), which is consistent with cost estimating guidelines for a conceptual design and the current level of project definition. Contingency was applied to the total project costs before escalation.

g. Escalation

Escalation was included in the estimate based on a typical schedule for implementation of a Dry FGD system at an escalation rate of 2.15% on equipment and materials and 3.35% on labor and indirects. These escalation rates were developed by S&L based on recent pricing and in-house escalation projections.

h. Interest During Construction

Interest during construction (IDC) accounts for the time value of money associated with the distribution of construction cash flows over the construction period. IDC was applied to the total EPC project costs including contingency. The IDC was calculated based on a typical schedule for implementation of a DSI system and a typical interest rate of 7.8% per year which was assumed based on a low interest market environment.

4.3. VARIABLE OPERATING AND MAINTENANCE COSTS

The following unit costs were used to develop the variable Operating and Maintenance (O&M) costs. All of these values, with the exception of the reagent costs, were provided by Entergy or are typical industry values confirmed by Entergy. The reagent costs are based on recent supplier quotes for the area.

Table 4-1: Unit Pricing for Utilities (Provided by Entergy)

Unit Cost	Units	Value
Pebble Lime	\$/ton	\$130.0
High Quality Water	\$/1000 gal	\$2.00
Low Quality Water	\$/1000 gal	\$0.50
Byproduct Disposal	\$/ton	\$7.50
Aux Power Cost ¹	\$/MWh	\$43.35

Note 1: Entergy provided auxiliary power costs for the first year of operation.

Table 4-2 below summarizes the consumption rates estimated as well as the first year variable O&M costs for the Dry FGD system.

Table 4-2: Variable O&M Rates and First Year Costs, per Unit

	Units	Value
Dry FGD System Parameters		
Reagent Consumption	lb/hr	4,800
Byproduct Waste Production	lb/hr	10,600
Aux Power Consumption	kW	10,000
High Quality Water Consumption	gpm	50
Low Quality Water Consumption	gpm	880
First Year¹ Variable O&M Costs (@CF²)		
Reagent Cost	\$/year	\$2,050,000
Byproduct Waste Disposal Cost	\$/year	\$261,000
Aux Power Cost	\$/year	\$2,628,000
Water Cost	\$/year	\$213,000
Bag and Cage Replacement Cost	\$/year	\$372,000
Total First Year Variable O&M Cost	\$/year	\$5,524,000

Note 1: First year costs are provided in \$2017.

Note 2: The first year costs are calculated using an annual capacity factor of 75.0%.

4.4. FIXED OPERATING AND MAINTENANCE COSTS

The fixed O&M costs for the systems consist of operating personnel as well as maintenance costs (including material and labor). Based on the conceptual design for the dry FGD system, the estimated staffing additions are 28 personnel for two systems on adjacent units.

The annual maintenance costs are estimated as a percentage of the total capital equipment cost, based on the amount of operating equipment which will require routine maintenance. For this evaluation, the maintenance costs (maintenance and labor) were estimated to be approximately 1.3% of the project capital. This is a lower value than typical because items such as track work and civil work are high capital cost items with little to no maintenance.

Table 4-3 below summarizes the first year fixed O&M costs for the design and typical cases.

Table 4-1: First Year Fixed O&M Costs for Dry FGD, per Unit

First Year¹ Fixed O&M Costs	Units	Value
Operating Labor ²	\$/year	\$1,660,000
Maintenance Material	\$/year	\$975,000
Maintenance Labor	\$/year	\$650,000
Total First Year Fixed O&M Cost	\$/year	\$3,285,000

Note 1: First year costs are provided in \$2017.

Note 2: Operating labor costs are based on a labor rate of \$56.95, which was provided by Entergy.

Note 3: Installation of systems on both units would require 28 operators total. For accounting purposes, this is considered 14 operators per unit.

5. SUMMARY

The cost estimate for the Independence Units 1&2 Dry FGD systems is based on the addition of two SDA FGD systems for SO₂ removal. The attached capital estimate for the Independence Dry FGD system is based on this technical basis and is presented in 2017 dollars.

6. ATTACHMENTS

1. Independence DFGD Project Units 1 and 2 Conceptual Capital Cost Estimate, Sargent & Lundy
Estimate No. 34261

**ENTERGY ARKANSAS
INDEPENDENCE STATION DRY (SDA) FGD
CONCEPTUAL COST ESTIMATE**

Estimator	A. KOCI
Labor rate table	17ARPBL
Project No.	13027-004
Estimate Date	10/04/2017
Reviewed By	GA
Approved By	BA
Estimate No.	34261A
Cost index	ARPBL

ENTERGY ARKANSAS
 INDEPENDENCE STATION DRY (SDA) FGD
 CONCEPTUAL COST ESTIMATE



Area	Description	Subcontract Cost	Process Equipment Cost	Material Cost	Man Hours	Labor Cost	Total Cost
101	FGD ISLAND	147,908,000	150,000,000	16,508,216	343,779	26,553,044	340,969,260
102	REAGENT HANDLING SYSTEM	5,830,400	2,591,000	1,325,175	39,706	3,315,997	13,062,572
105	BYPRODUCT HANDLING SYSTEM	6,120,000	6,810,000	792,075	103,041	8,417,500	22,139,575
121	CIVIL BOP	350,000		3,731,841	63,706	8,336,292	12,418,133
151	MECHANICAL BOP	720,000	1,647,000	5,962,113	88,963	8,343,711	16,672,824
190	DEMOLITION / RELOCATION			1,800,000	33,333	3,276,667	5,076,667
201	ELECTRICAL BOP SYSTEM		12,300,000	11,500,000	284,184	22,691,518	46,491,518
211	INSTRUMENTATION AND CONTROLS BOP SYSTEM		1,500,000	1,085,000	10,920	789,374	3,374,374
	TOTAL DIRECT	160,928,400	174,848,000	42,704,420	967,632	81,724,103	460,204,922

**ENTERGY ARKANSAS
 INDEPENDENCE STATION DRY (SDA) FGD
 CONCEPTUAL COST ESTIMATE**



Estimate Totals

Description	Amount	Totals	Hours
Direct Costs:			
Labor	81,724,103		967,632
Material	42,704,420		
Subcontract	160,928,400		
Process Equipment	174,848,000		
	460,204,923	460,204,923	
Other Direct & Construction			
Indirect Costs:			
91-1 Scaffolding	5,721,000		
91-2 Cost Due To OT 5-10's	11,337,000		
91-4 Per Diem	9,676,000		
91-5 Consumables	817,077		
91-6 Freight on Material	2,135,000		
91-8 Sales Tax	7,566,000		
91-9 Contractors G&A	15,776,000		
91-10 Contractors Profit	7,888,000		
	60,916,077	521,121,000	
Indirect Costs:			
93-1 Engineering Services	23,000,000		
93-4 SU/S Parts/ Initial Fills	300,000		
93-5 Technical Field Advisors	600,000		
93-8 EPC Fee	54,502,000		
	78,402,000	599,523,000	
Escalation:			
96-1 Escalation on Material	5,731,000		
96-2 Escalation on Labor	20,520,000		
96-3 Escalation on Subcontract	26,919,000		
96-4 Escalation on Process Eq	17,974,000		
96-5 Escalation on Indirects	12,802,000		
	83,946,000	683,469,000	
Total EPC Cost		683,469,000	
Owner's Costs:			
99-1 Owner's Costs	47,962,000		
	47,962,000	731,431,000	
Third Party Services:			
100 CM Oversight	4,969,000		
102 Start-up Oversight	550,000		
103 Owner's Engineer	6,500,000		
104 Performance Testing	275,000		
	12,294,000	743,725,000	
Project Contingency :			
110 Project Contingency	98,966,000		
	98,966,000	842,691,000	
Escalation Addition:			
120 Escalation on Lines 99-110	8,897,000		
	8,897,000	851,588,000	
Interest During Construction:			
130 Interest During Constr.	132,199,000		
	132,199,000	983,787,000	
Total		983,787,000	

ENTERGY ARKANSAS
 INDEPENDENCE STATION DRY (SDA) FGD
 CONCEPTUAL COST ESTIMATE



Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Process Equipment Cost	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
101			FGD ISLAND									
	21.00.00		CIVIL WORK									
		21.53.00	PILING									
			PILE - MOB/DEMOB		1.00	LS	100,000	-		115.48	/MH	100,000
			PILE - 18" AUGER CAST X 60' LONG	UNIT 1 DUCTWORK (NOT INCLUDED IN FGD ISLAND SCOPE)	138.00	EA	496,800	-		115.48	/MH	496,800
			PILE - 18" AUGER CAST X 60' LONG	UNIT 2 DUCTWORK (NOT INCLUDED IN FGD ISLAND SCOPE)	138.00	EA	496,800	-		115.48	/MH	496,800
			PILE - 18" AUGER CAST X 60' LONG	UNIT 1 BAGHOUSE FDN	252.00	EA	907,200	-		115.48	/MH	907,200
			PILE - 18" AUGER CAST X 60' LONG	UNIT 2 BAGHOUSE FDN	252.00	EA	907,200	-		115.48	/MH	907,200
			PILING				2,908,000					2,908,000
		21.54.00	CAISSON									
			2.5 FT DIA X 30 FT DEEP CAISSON	ABSORBER TOWERS FOUNDATIONS	180.00	EA	-	334,260	4,552	115.48	/MH	525,633
			2.5 FT DIA X 30 FT DEEP CAISSON	ABSORBER TOWERS FOUNDATIONS	180.00	EA	-	334,260	4,552	115.48	/MH	525,633
			2.5 FT DIA X 30 FT DEEP CAISSON	REAGENT PREP ENCLOSURE 50'X50' SUBSTRUCTURE	50.00	EA	-	92,850	1,264	115.48	/MH	146,009
			2.5 FT DIA X 30 FT DEEP CAISSON	BYPRODUCTS RECYCLE EQUIPMENT BLDG 60' X 60' SUBSTRUCTURE	72.00	EA	-	133,704	1,821	115.48	/MH	210,253
			2.5 FT DIA X 30 FT DEEP CAISSON	UNIT 1 BOOSTER FAN FOUNDATION	40.00	EA	-	74,280	1,011	115.48	/MH	116,807
			2.5 FT DIA X 30 FT DEEP CAISSON	UNIT 2 BOOSTER FAN FOUNDATION	40.00	EA	-	74,280	1,011	115.48	/MH	116,807
			CAISSON					1,043,634	14,211		1,641,143	2,684,777
			CIVIL WORK				2,908,000	1,043,634	14,211		1,641,143	5,592,777
	22.00.00		CONCRETE									
		22.13.00	CONCRETE									
			MAT FOUNDATION LESS THAN 5FT THICK, 4500 PSI - COMPOSITE RATE	REAGENT PREP ENCLOSURE 50'X50' SUBSTRUCTURE	300.00	CY	-	69,000	2,414	68.52	/MH	165,393
			MAT FOUNDATION LESS THAN 5FT THICK, 4500 PSI - COMPOSITE RATE	BYPRODUCTS RECYCLE EQUIPMENT BLDG 60' X 60' SUBSTRUCTURE	432.00	CY	-	99,360	3,476	68.52	/MH	238,166
			MAT FOUNDATION LESS THAN 5FT THICK, 4500 PSI - COMPOSITE RATE	UNIT 1 BOOSTER FAN FOUNDATION	600.00	CY	-	138,000	4,828	68.52	/MH	330,786
			MAT FOUNDATION LESS THAN 5FT THICK, 4500 PSI - COMPOSITE RATE	UNIT 2 BOOSTER FAN FOUNDATION	600.00	CY	-	138,000	4,828	68.52	/MH	330,786
			SLAB FOUNDATION LESS THAN 2 FT THICK, 4500 PSI, - COMPOSITE RATE	UNIT 1 DUCTWORK (NOT INCLUDED IN FGD ISLAND SCOPE)	966.00	CY	-	222,180	7,772	68.52	/MH	532,566
			SLAB FOUNDATION LESS THAN 2 FT THICK, 4500 PSI, - COMPOSITE RATE	UNIT 2 DUCTWORK (NOT INCLUDED IN FGD ISLAND SCOPE)	966.00	CY	-	222,180	7,772	68.52	/MH	532,566
			CONCRETE FOUNDATIONS - COMPOSITE RATE	ABSORBER TOWER FOUNDATION	1,300.00	CY	-	299,000	10,460	68.52	/MH	716,703
			CONCRETE FOUNDATIONS - COMPOSITE RATE	ABSORBER TOWERS FOUNDATIONS	1,300.00	CY	-	299,000	10,460	68.52	/MH	716,703
			CONCRETE FOUNDATIONS - COMPOSITE RATE	LIME SLURRY FEED TANKS	400.00	CY	-	92,000	3,218	68.52	/MH	220,524
			CONCRETE FOUNDATIONS - COMPOSITE RATE	UNIT 1 BAGHOUSE FDN 3 FDNS 83'X63'X3'	1,743.00	CY	-	400,890	14,024	68.52	/MH	960,934
			CONCRETE FOUNDATIONS - COMPOSITE RATE	8' X 10' UNIT 1 BAGHOUSE AREA, COMPRESSOR BLDG	6.00	CY	-	1,380	48	68.52	/MH	3,308
			CONCRETE FOUNDATIONS - COMPOSITE RATE	UNIT 2 BAGHOUSE FDN 3 FDNS 83'X63'X3'	1,743.00	CY	-	400,890	14,024	68.52	/MH	960,934
			CONCRETE FOUNDATIONS - COMPOSITE RATE	8' X 10' UNIT 2 BAGHOUSE AREA, TRUCK SCALE HOUSE	6.00	CY	-	1,380	48	68.52	/MH	3,308
			CONCRETE					2,383,260	83,372		5,712,678	8,095,938
			CONCRETE					2,383,260	83,372		5,712,678	8,095,938
	23.00.00		STEEL									
		23.17.00	GALLERY									
			GALVANIZED GRATING, 1 1/4" DEEP x 3/16" BEARING BAR WITH HOLD DOWN CLIPS	REAGENT PREP ENCLOSURE 50'X50' SUPERSTRUCTURE	4,000.00	SF	-	60,000	460	72.48	/MH	33,324
			GALVANIZED GRATING, 1 1/4" DEEP x 3/16" BEARING BAR WITH HOLD DOWN CLIPS	BYPRODUCTS RECYCLE EQUIPMENT BLDG	5,760.00	SF	-	86,400	662	72.48	/MH	47,987
			3" HEAVY DUTY GRATING	WASTE MANAGEMENT FACILITY (REPLACES HAZMAT BLDG)	200.00	SF	-	11,200	39	72.48	/MH	2,833
			DOUBLE PIPE HANDRAIL WITH POSTS AND GUARD PLATES, PAINTED	REAGENT PREP ENCLOSURE 50'X50' SUPERSTRUCTURE	3,000.00	LF	-	159,000	621	72.48	/MH	44,988
			DOUBLE PIPE HANDRAIL WITH POSTS AND GUARD PLATES, PAINTED	BYPRODUCTS RECYCLE EQUIPMENT BLDG	4,320.00	LF	-	228,960	894	72.48	/MH	64,782
			SELF CLOSING SWING GATE - USER DEFINED	REAGENT PREP ENCLOSURE 50'X50' SUPERSTRUCTURE	40.00	EA	-	11,200	184	72.48	/MH	13,330
			SELF CLOSING SWING GATE - USER DEFINED	BYPRODUCTS RECYCLE EQUIPMENT BLDG	58.00	EA	-	16,240	267	72.48	/MH	19,328
			LADDER	REAGENT PREP ENCLOSURE 50'X50' SUPERSTRUCTURE	800.00	LF	-	40,000	368	72.48	/MH	26,659
			LADDER	BYPRODUCTS RECYCLE EQUIPMENT BLDG	1,100.00	LF	-	55,000	506	72.48	/MH	36,657
			STAIR SYSTEM	REAGENT PREP ENCLOSURE 50'X50' SUPERSTRUCTURE	2,400.00	SF	-	218,400	3,172	72.48	/MH	229,937

ENTERGY ARKANSAS
 INDEPENDENCE STATION DRY (SDA) FGD
 CONCEPTUAL COST ESTIMATE



Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Process Equipment Cost	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
		23.17.00	GALLERY STAIR SYSTEM GALLERY	BYPRODUCTS RECYCLE EQUIPMENT BLDG	3,500.00 SF	-	-	318,500 1,204,900	4,626 11,798	72.48 /MH	335,324 855,147	653,824 2,060,047
		23.25.00	ROLLED SHAPE LIGHT WEIGHT MEMBERS, LESS THAN 20 LB/LF, TWO COAT PAINT LIGHT WEIGHT MEMBERS, LESS THAN 20 LB/LF, TWO COAT PAINT LIGHT WEIGHT MEMBERS, LESS THAN 20 LB/LF, GALVANIZED LIGHT WEIGHT MEMBERS, LESS THAN 20 LB/LF, GALVANIZED BUILDING MIX, TWO COAT PAINTED BUILDING MIX, TWO COAT PAINTED BUILDING MIX, TWO COAT PAINTED BUILDING MIX, TWO COAT PAINTED ROLLED SHAPE STEEL	REAGENT PREP ENCLOSURE 50'X50' GALLERY SUPPORT BYPRODUCTS RECYCLE EQUIPMENT BLDG U1 BAGHOUSE SKIRTS STEEL GIRTS U2 BAGHOUSE SKIRTS STEEL GIRTS - - REAGENT PREP ENCLOSURE SUPERSTRUCTURE BYPRODUCTS RECYCLE EQUIPMENT BLDG	200.00 TN 288.00 TN 36.00 TN 36.00 TN 50.00 TN 50.00 TN 500.00 TN 720.00 TN	- - - - - - - -	716,000 1,031,040 138,240 138,240 128,000 128,000 1,280,000 1,843,200 5,402,720 6,607,620	5,057 7,283 910 910 920 920 9,195 13,241	98.30 /MH 98.30 /MH 98.30 /MH 98.30 /MH 98.30 /MH 98.30 /MH 98.30 /MH 98.30 /MH	497,149 715,895 89,487 89,487 90,391 90,391 903,908 1,301,628 3,778,336 4,633,483	1,213,149 1,746,935 227,727 227,727 218,391 218,391 2,183,908 3,144,828 9,181,056 11,241,103	
	24.00.00	24.17.00	ARCHITECTURAL ELEVATOR PASSENGER, TRACTION, 4 STOPS, 3500LB, 350 FT/MIN ELEVATOR	SCHINDLER ELEVATOR BUDGET	2.00 LS	-	-	318,700 318,700	1,885 1,885	114.46 /MH	215,764 215,764	534,464 534,464
		24.35.00	PRE-ENGINEERED BUILDING PRE-ENGINEERED BUILDING PRE-ENGINEERED BUILDING PRE-ENGINEERED BUILDING	8' X 10' UNIT 1 BAGHOUSE AREA, COMPRESSOR BLDG 8' X 10' UNIT 2 BAGHOUSE AREA, TRUCK SCALE HOUSE	1.00 LT 1.00 LT	- -	- -	20,000 10,000 30,000	115 115 230	98.30 /MH 98.30 /MH	11,299 11,299 22,598	31,299 21,299 52,598
		24.37.00	ROOFING METAL, INSULATED, 2 IN GALVANIZED, PAINTED, 22 GA METAL, INSULATED, 2 IN GALVANIZED, PAINTED, 22 GA METAL, INSULATED- USER DEFINED METAL, INSULATED- USER DEFINED ROOFING	U1 SDA TOP ENCLOSURE ROOF U2 SDA TOP ENCLOSURE ROOF REAGENT PREP ENCLOSURE SUPERSTRUCTURE BYPRODUCTS RECYCLE EQUIPMENT BLDG	3,318.00 SF 3,318.00 SF 2,500.00 SF 3,600.00 SF	- - - -	- - - -	54,946 54,946 19,425 27,972 157,289	339 339 862 1,241 2,782	60.10 /MH 60.10 /MH 60.10 /MH 60.10 /MH	20,400 20,400 51,810 74,607 167,216	75,346 75,346 71,235 102,579 324,506
		24.41.00	SIDING METAL, INSULATED, 2 IN THICK FIBERGLASS, 22 GA, GALVANIZED PAINTED METAL, INSULATED, 2 IN THICK FIBERGLASS, 22 GA, GALVANIZED PAINTED METAL, INSULATED, 2 IN THICK FIBERGLASS, 22 GA, GALVANIZED PAINTED METAL, INSULATED, 2 IN THICK FIBERGLASS, 22 GA, GALVANIZED PAINTED METAL, UNINSULATED, 24 GA, GALVANIZED CORRUGATED METAL, UNINSULATED, 24 GA, GALVANIZED CORRUGATED SIDING	U1 SDA TOP ENCLOSURE SIDING U2 SDA TOP ENCLOSURE SIDING REAGENT PREP ENCLOSURE BYPRODUCTS RECYCLE EQUIPMENT BLDG U1 BAGHOUSE SKIRTS 6x(83'+63) x30' tall ' U2 BAGHOUSE SKIRTS 6x(83'+63) x30' tall '	2,450.00 SF 2,450.00 SF 10,000.00 SF 14,400.00 SF 26,260.00 SF 26,280.00 SF	- - - - - -	- - - - - -	40,572 40,572 165,600 238,464 85,345 85,410 655,963	251 251 1,023 1,473 1,238 1,238 5,473	87.92 /MH 87.92 /MH 87.92 /MH 87.92 /MH 87.92 /MH 87.92 /MH	22,036 22,036 89,941 129,515 108,805 108,887 481,220	62,608 62,608 255,541 367,979 194,150 194,297 1,137,183
		24.99.00	ARCHITECTURAL, MISCELLANEOUS PENTHOUSE HEATING PENTHOUSE LIGHTING PENTHOUSE FIRE PROTECTION PENTHOUSE HEATING PENTHOUSE LIGHTING PENTHOUSE FIRE PROTECTION ARCHITECTURAL, MISCELLANEOUS - USER DEFINED ARCHITECTURAL, MISCELLANEOUS - USER DEFINED ARCHITECTURAL, MISCELLANEOUS	U1 SDA SUPERSTRUCTURE U1 SDA SUPERSTRUCTURE U1 SDA SUPERSTRUCTURE U2 SDA SUPERSTRUCTURE U2 SDA SUPERSTRUCTURE U2 SDA SUPERSTRUCTURE U1 BAGHOUSE SKIRTS MANDOORS U2 BAGHOUSE SKIRTS MANDOORS	6,400.00 SF 6,400.00 SF 6,400.00 SF 6,400.00 SF 6,400.00 SF 6,400.00 SF 3.00 EA 3.00 EA	- - - - - - - -	64,000 64,000 32,000 64,000 64,000 32,000 1,500 1,500 323,000	74 74 37 74 74 37 28 28 423	73.32 /MH 84.60 /MH 84.60 /MH 73.32 /MH 84.60 /MH 84.60 /MH 58.15 /MH 58.15 /MH	5,394 6,223 3,112 5,394 6,223 3,112 1,604 1,604 32,666	69,394 70,223 35,112 69,394 70,223 35,112 3,104 3,104 355,666	
			ARCHITECTURAL, MISCELLANEOUS					1,484,952	10,794		919,463	2,404,415
	31.00.00	31.41.00	MECHANICAL EQUIPMENT FIRE PROTECTION EQUIPMENT & SYSTEM									

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Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Process Equipment Cost	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
		31.41.00	FIRE PROTECTION EQUIPMENT & SYSTEM									
			FIRE PROTECTION EQUIPMENT & SYSTEM - USER DEFINED	REAGENT PREP ENCLOSURE 50'X50' FIRE PROTECTION ALLOWANCE	5,000.00 SF	-	-	27,500	385	75.53 /MH	29,083	56,583
			FIRE PROTECTION EQUIPMENT & SYSTEM - USER DEFINED	BYPRODUCTS RECYCLE EQUIPMENT BLDG' FIRE PROTECTION ALLOWANCE	10,800.00 SF	-	-	59,400	832	75.53 /MH	62,820	122,220
			FIRE PROTECTION EQUIPMENT & SYSTEM					86,900	1,217		91,904	178,804
		31.45.00	FGD EQUIPMENT									
			DRY FGD ISLAND -UNITS 1 & 2 FGD SYSTEMS	INCLUDES ABSORBERS, BAGHOUSES, REAGENT PREP, BYPRODUCT RECYCLE, ID BOOSTER FANS, CONTROLS, PIPING, DUCTWORK, AND WIRING WITHIN FGD ISLAND (BASED ON RECENT BUDGETARY QUOTE FROM SIMILARLY SIZED PROJECT)	1.00 LS		150,000,000	-		100.38 /MH		150,000,000
			DRY FGD ISLAND -UNITS 1 & 2 FGD SYSTEMS	INSTALLATION COST FOR DRY FGD ISLAND INCLUDING ITEMS LISTED ABOVE	1.00 LS	145,000,000		-		100.38 /MH		145,000,000
			FGD EQUIPMENT			145,000,000	150,000,000					295,000,000
			MECHANICAL EQUIPMENT			145,000,000	150,000,000	86,900	1,217		91,904	295,178,804
		34.00.00	HVAC									
		34.99.00	HVAC, MISCELLANEOUS									
			HVAC, MISCELLANEOUS - HVAC ALLOWANCE	REAGENT PREP ENCLOSURE 50'X50' LIGHTING ALLOWANCE	5,000.00 SF	-	-	55,000	57	73.32 /MH	4,214	59,214
			HVAC, MISCELLANEOUS - HVAC ALLOWANCE	BYPRODUCTS RECYCLE EQUIPMENT BLDG LIGHTING ALLOWANCE	10,800.00 SF	-	-	118,800	124	73.32 /MH	9,102	127,902
			HVAC, MISCELLANEOUS					173,800	182		13,316	187,116
			HVAC					173,800	182		13,316	187,116
		36.00.00	INSULATION									
		36.13.00	DUCT									
			MINERAL WOOL INSULATION, 4 IN THICK, 8 LB/CF DENSITY, ALUMINUM LAGGING, INSTALLED IN PLACE	U1 BAGHOUSE INSULATION TOP, SIDES AND HOPPERS	141,831.00 SF	-	-	850,986	35,050	73.69 /MH	2,582,848	3,433,834
			MINERAL WOOL INSULATION, 4 IN THICK, 8 LB/CF DENSITY, ALUMINUM LAGGING, INSTALLED IN PLACE	U2 BAGHOUSE INSULATION - TOPS, SIDES AND HOPPERS	141,831.00 SF	-	-	850,986	35,050	73.69 /MH	2,582,848	3,433,834
			MINERAL WOOL INSULATION, 6 IN THICK, 8 LB/CF DENSITY, ALUMINUM LAGGING, INSTALLED IN PLACE	SDA SHELL INSULATION	40,167.00 SF	-	-	261,086	10,388	73.69 /MH	765,493	1,026,578
			MINERAL WOOL INSULATION, 6 IN THICK, 8 LB/CF DENSITY, ALUMINUM LAGGING, INSTALLED IN PLACE	SDA ROOF INSULATION	11,019.00 SF	-	-	71,624	2,850	73.69 /MH	209,997	281,621
			MINERAL WOOL INSULATION, 6 IN THICK, 8 LB/CF DENSITY, ALUMINUM LAGGING, INSTALLED IN PLACE	SDA SHELL INSULATION	40,167.00 SF	-	-	261,086	10,388	73.69 /MH	765,493	1,026,578
			MINERAL WOOL INSULATION, 6 IN THICK, 8 LB/CF DENSITY, ALUMINUM LAGGING, INSTALLED IN PLACE	SDA ROOF INSULATION	11,019.00 SF	-	-	71,624	2,850	73.69 /MH	209,997	281,621
			MINERAL WOOL INSULATION, 6 IN THICK, 8 LB/CF DENSITY, ALUMINUM LAGGING, INSTALLED IN PLACE	UNIT 1 DUCTWORK (NOT INCLUDED IN FGD ISLAND SCOPE)	168,220.00 SF	-	-	1,093,430	43,505	73.69 /MH	3,205,896	4,299,326
			MINERAL WOOL INSULATION, 6 IN THICK, 8 LB/CF DENSITY, ALUMINUM LAGGING, INSTALLED IN PLACE	UNIT 2 DUCTWORK (NOT INCLUDED IN FGD ISLAND SCOPE)	168,220.00 SF	-	-	1,093,430	43,505	73.69 /MH	3,205,896	4,299,326
			DUCT					4,554,250	183,586		13,528,470	18,082,720
			INSULATION					4,554,250	183,586		13,528,470	18,082,720
		41.00.00	ELECTRICAL EQUIPMENT									
		41.37.00	LIGHTING ACCESSORY (FIXTURE)									
			LIGHTING ACCESSORY (FIXTURE) - ALLOWANCE	REAGENT PREP ENCLOSURE 50'X50' LIGHTING ALLOWANCE	5,000.00 SF	-	-	55,000	57	69.31 /MH	3,983	58,983
			LIGHTING ACCESSORY (FIXTURE) - ALLOWANCE	BYPRODUCTS RECYCLE EQUIPMENT BLDG LIGHTING ALLOWANCE	10,800.00 SF	-	-	118,800	124	69.31 /MH	8,604	127,404
			LIGHTING ACCESSORY (FIXTURE)					173,800	182		12,587	186,387
			ELECTRICAL EQUIPMENT					173,800	182		12,587	186,387
			101 FGD ISLAND			147,908,000	150,000,000	16,508,216	343,779		26,553,044	340,969,260
102		21.00.00	REAGENT HANDLING SYSTEM									
			CIVIL WORK									
		21.14.00	STRIP & STOCKPILE TOPSOIL									
			STRIP & STOCKPILE TOPSOIL - 12' STRIP & STOCKPILE TOPSOIL	EXTEND REAGENT RAIL TRACK	22,500.00 SF	-	-		52	185.95 /MH	9,618	9,618
									52		9,618	9,618
		21.41.00	EROSION AND SEDIMENTATION CONTROL									
			CRUSHED ROCK SURFACING, 12" DEEP WHITE ROCK	EXTEND REAGENT RAIL TRACK	2,500.00 SY	-	-	26,625	86	103.37 /MH	8,911	35,536

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Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Process Equipment Cost	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost	
			EROSION AND SEDIMENTATION CONTROL						26,625	86		8,911	35,536
	21.53.00		PILING										
			PILE - 18" AUGER CAST X 60' LONG	UNLOADING SHED 200' X 75 WIDE	64.00 EA	230,400	-			115.48 /MH		230,400	
			PILING			230,400						230,400	
	21.54.00		CAISSON										
			2.5 FT DIA X 30 FT DEEP CAISSON	SUBSTRUCTURE 2200 TON LIME STORAGE SILOS	100.00 EA	-	-	185,700	2,529	115.48 /MH	292,018	477,718	
			CAISSON					185,700	2,529		292,018	477,718	
	21.71.00		TRACKWORK										
			LIME RAILCAR UNLOADING SPUR	ALLOWANCE	1,000.00 LF	-	-	170,000	1,724	87.32 /MH	150,552	320,552	
			TRACKWORK					170,000	1,724		150,552	320,552	
			CIVIL WORK			230,400		382,325	4,391		461,099	1,073,824	
	22.00.00		CONCRETE										
	22.13.00		CONCRETE										
			MAT FOUNDATION LESS THAN 5FT THICK, 4500 PSI - COMPOSITE RATE	SUBSTRUCTURE 2-2,000 TON LIME STORAGE SILOS	600.00 CY	-	-	138,000	4,828	68.52 /MH	330,786	468,786	
			FOUNDATION, 4500 PSI - COMPOSITE RATE	UNLOADING SHED 200' X 75 WIDE	925.00 CY	-	-	212,750	7,443	68.52 /MH	509,962	722,712	
			CONCRETE					350,750	12,270		840,748	1,191,498	
			CONCRETE					350,750	12,270		840,748	1,191,498	
	24.00.00		ARCHITECTURAL										
	24.35.00		PRE-ENGINEERED BUILDING										
			SHELL ONLY, STEEL UNINSULATED 22 GA, PRE-ENGINEERED BUILDING	UNLOADING SHED 200' X 75 WIDE x15' TALL	15,000.00 SF	-	-	525,000	4,828	98.30 /MH	474,552	999,552	
			ARCHITECTURAL					525,000	4,828		474,552	999,552	
			ARCHITECTURAL					525,000	4,828		474,552	999,552	
	26.00.00		MISCELLANEOUS STRUCTURAL ITEM										
	26.13.00		CONCRETE SILO										
			CONCRETE SILO - 2,000 TON LIME STORAGE SILO	SUBCONTRACT - ERECTED	2.00 LS	5,600,000	-	-		68.52 /MH		5,600,000	
			CONCRETE SILO - BIN VENT FILTERS	INCLUDED W/ SILO	1.00 LS	-	-	-	0	/MH			
			CONCRETE SILO - LEVEL INDICATOR	INCLUDED W/ SILO	1.00 LS	-	-	-	0	/MH			
			CONCRETE SILO - VACUUM PRESSURE RELIEF VALVE	INCLUDED W/ SILO	1.00 LS	-	-	-	0	/MH			
			CONCRETE SILO - MANHOLE	INCLUDED W/ SILO	1.00 LS	-	-	-	0	/MH			
			CONCRETE SILO			5,600,000			0			5,600,000	
			MISCELLANEOUS STRUCTURAL ITEM			5,600,000			0			5,600,000	
	31.00.00		MECHANICAL EQUIPMENT										
	31.25.00		CRANES & HOISTS										
			CRANES & HOISTS & TROLLEYS	REAGENT HANDLING SYSTEM ALLOWANCE	1.00 LT	-	-	275,000		75.53 /MH		275,000	
			CRANES & HOISTS					275,000				275,000	
			MECHANICAL EQUIPMENT					275,000				275,000	
	33.00.00		MATERIAL HANDLING EQUIPMENT										
	33.14.00		MATERIAL HANDLING EQUIPMENT										
			LIME HANDLING SYSTEM - 25 TPH PNEUMATIC TRAIN UNLOADING SYSTEM		1.00 LS	-	500,000	-	3,306	75.53 /MH	249,683	749,683	
			LIME HANDLING SYSTEM - VACUUM EXHAUSTER WITH SOUND ENCLOSURES	INCLUDED WITH 25 TPH PNEUMATIC TRAIN UNLOADING SYSTEM	2.00 LS	-	-	-		/MH			
			LIME HANDLING SYSTEM - RECEIVING PANS UNDER RAIL CARS	INCLUDED WITH 25 TPH PNEUMATIC TRAIN UNLOADING SYSTEM	1.00 LS	-	-	-		/MH			
			LIME HANDLING SYSTEM - FILTER SEPARATORS ON TOP OF SILO	INCLUDED WITH 25 TPH PNEUMATIC TRAIN UNLOADING SYSTEM	1.00 LS	-	-	-		/MH			
			LIME HANDLING SYSTEM - 25 TPH PNEUMATIC TRANSPORT SYSTEM		2.00 LS	-	1,000,000	-	6,611	75.53 /MH	499,366	1,499,366	
			LIME HANDLING SYSTEM - PRESSURE BLOWERS WITH SOUND ENCLOSURES	INCLUDED WITH 25 TPH PNEUMATIC TRANSPORT SYSTEM	3.00 LS	-	-	-		/MH			
			LIME HANDLING SYSTEM - PRESSURE FEEDERS	INCLUDED WITH 25 TPH PNEUMATIC TRANSPORT SYSTEM	1.00 LS	-	-	-		/MH			
			LIME HANDLING SYSTEM - SPARE PARTS FOR STARTUP AND SPECIAL TOOLS		1.00 LS	-	8,000	-		75.53 /MH		8,000	
			LIME HANDLING SYSTEM - FREIGHT		1.00 LS	-	50,000	-		75.53 /MH		50,000	
			MATERIAL HANDLING EQUIPMENT				1,558,000		9,917		749,049	2,307,049	
	33.41.00		MOBILE YARD EQUIPMENT										

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		33.41.00	MOBILE YARD EQUIPMENT MOBILE YARD EQUIPMENT - TRACKMOBILE MOBILE YARD EQUIPMENT	REAGENT HANDLING SYSTEM	1.00 EA	-	225,000	-		75.53 /MH		225,000
							225,000					225,000
		33.51.00	RAIL CAR UNLOADER RAIL CAR UNLOADER - RAIL CAR UNLOADER	IN UNLOADING SHED 200'X75' WIDE	2.00 LT	-	270,000	-	3,724	98.30 /MH	366,083	636,083
							270,000		3,724		366,083	636,083
			MATERIAL HANDLING EQUIPMENT				2,053,000		13,641		1,115,132	3,168,132
	34.00.00		HVAC									
		34.99.00	HVAC, MISCELLANEOUS HVAC, MISCELLANEOUS - HVAC ALLOWANCE HVAC, MISCELLANEOUS	2-2000 TON LIME STORAGE SILOS	3,600.00 SF	-	-	39,600	41	73.32 /MH	3,034	42,634
								39,600	41		3,034	42,634
			HVAC					39,600	41		3,034	42,634
	35.00.00		PIPING									
		35.14.10	CARBON STEEL, STRAIGHT RUN 8 IN DIA, SCH 40, 8" VACUUM CONVEY PIPING WITH 4 ELBOWS	TO SUPPORT 25 TPH PNEUMATIC TRAIN UNLOADING SYSTEM	500.00 LF	-	38,000	-	540	93.09 /MH	50,290	88,290
			12 IN DIA, 3/8 IN STD- 2500 LF OF 10"/12" TRANSPORT PRESSURE PIPING W 8 ELBOWS	TO SUPPORT 25 TPH PNEUMATIC TRANSPORT SYSTEM	2,500.00 LF	-	225,000	-	3,966	93.09 /MH	369,150	594,150
			CARBON STEEL, STRAIGHT RUN				263,000		4,506		419,440	682,440
			PIPING				263,000		4,506		419,440	682,440
	41.00.00		ELECTRICAL EQUIPMENT									
		41.37.00	LIGHTING ACCESSORY (FIXTURE) LIGHTING ACCESSORY (FIXTURE) - ALLOWANCE LIGHTING ACCESSORY (FIXTURE)	2-2000 TON LIME STORAGE SILO	2,500.00 SF	-	-	27,500	29	69.31 /MH	1,992	29,492
								27,500	29		1,992	29,492
			ELECTRICAL EQUIPMENT					27,500	29		1,992	29,492
			102 REAGENT HANDLING SYSTEM				5,830,400	2,591,000	1,325,175	39,706	3,315,997	13,062,572
105			BYPRODUCT HANDLING SYSTEM									
	21.00.00		CIVIL WORK									
		21.54.00	CAISSON 2.5 FT DIA X 30 FT DEEP CAISSON	ASH SILO AND FGD BYPRODUCT SILOS	125.00 EA	-	-	232,125	3,161	115.48 /MH	365,023	597,148
			CAISSON					232,125	3,161		365,023	597,148
			CIVIL WORK					232,125	3,161		365,023	597,148
	22.00.00		CONCRETE									
		22.13.00	CONCRETE MAT FOUNDATION LESS THAN 5FT THICK, 4500 PSI - COMPOSITE RATE	FGD BYPRODUCT SILOS	614.00 CY	-	-	141,220	4,940	68.52 /MH	338,505	479,725
			MAT FOUNDATION LESS THAN 5FT THICK, 4500 PSI - COMPOSITE RATE	FLY ASH BLENDING SILO	67.00 CY	-	-	15,410	539	68.52 /MH	36,938	52,348
			SLAB FOUNDATION LESS THAN 2 FT THICK, 4500 PSI, - COMPOSITE RATE	FOR TRUCK SCALES	144.00 CY	-	-	33,120	1,159	68.52 /MH	79,389	112,509
			SLAB FOUNDATION LESS THAN 2 FT THICK, 4500 PSI, - COMPOSITE RATE	MISC	100.00 CY	-	-	23,000	805	68.52 /MH	55,131	78,131
			CONCRETE					212,750	7,443		509,962	722,712
			CONCRETE					212,750	7,443		509,962	722,712
	23.00.00		STEEL									
		23.13.75	SILO NEW 250 TON FLYASH BLENDING BIN SILO - 24FT DIA X 72 FT HIGH - ERECTION AND FREIGHT INCLUDED	SILO	1.00 EA	-	275,000	-	2,839	80.89 /MH	229,653	504,653
			SILO				275,000		2,839		229,653	504,653
			STEEL				275,000		2,839		229,653	504,653
	26.00.00		MISCELLANEOUS STRUCTURAL ITEM									
		26.13.00	CONCRETE SILO CONCRETE SILO - 2-2,200 TON FGD BYPRODUCT SILO CONCRETE SILO - BIN VENT FILTERS CONCRETE SILO - LEVEL INDICATOR CONCRETE SILO - VACUUM PRESSURE RELIEF VALVE CONCRETE SILO - MANHOLE	SUBCONTRACTED - ERECTED INCLUDED W/ SILO INCLUDED W/ SILO INCLUDED W/ SILO INCLUDED W/ SILO	2.00 LS 1.00 LS 1.00 LS 1.00 LS 1.00 LS	6,000,000 - - - -	- - - - -	- - - - -	68.52 /MH 0 /MH 0 /MH 0 /MH 0 /MH			6,000,000

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Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Process Equipment Cost	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
			CONCRETE SILO			6,000,000				0		6,000,000
			MISCELLANEOUS STRUCTURAL ITEM			6,000,000				0		6,000,000
33.00.00			MATERIAL HANDLING EQUIPMENT									
	33.13.00		BYPRODUCT HANDLING EQUIPMENT									
			PNEUMATIC ASH CONVEYORS	EQUIPMENT INCLUDES FREIGHT	1.00 LS	-	5,655,000	-		80.89 /MH		5,655,000
			PNEUMATIC ASH CONVEYORS	INSTALLATION COST	1.00 LT	-	-	-	79,293	80.89 /MH	6,414,019	6,414,019
			BLOWERS, PRESSURE FEEDERS, TRANSPORT PIPING AND VACUUM / PRESSURE RELIEF VALVES	INCLUDED ABOVE	1.00 LT	-	-	-		80.89 /MH		
			-FOUR PIN MIXERS BELOW CONCRETE SILOS INCL ALL VALVES AND ACCESSORIES		1.00 LT	-	540,000	-	3,347	80.89 /MH	270,749	810,749
			-DRY UNLOADING SPOUT BELOW THE PRODUCT SILO		2.00 EA	-	60,000	-	258	80.89 /MH	20,883	80,883
			AIRSLIDE CONVEYORS FROM BLENDING BIN MIXER/PIPE CONVEYOR, INCL ALL VALVES AND ACCESSORIES		4.00 EA	-	80,000	-	688	80.89 /MH	55,675	135,675
			BYPRODUCT HANDLING EQUIPMENT				6,335,000		83,587		6,761,325	13,096,325
	33.57.00		SCALE									
			SCALE - NEW TRUCK SCALES	BYPRODUCT HANDLING SYSTEM	2.00 EA	-	200,000	-	460	75.53 /MH	34,726	234,726
			SCALE				200,000		460		34,726	234,726
			MATERIAL HANDLING EQUIPMENT				6,535,000		84,046		6,796,052	13,331,052
34.00.00			HVAC									
	34.37.00		DUST COLLECTOR									
			DUST COLLECTOR - INSTALLED COST		1.00 LS	120,000	-	-		73.32 /MH		120,000
			DUST COLLECTOR			120,000						120,000
			HVAC			120,000						120,000
35.00.00			PIPING									
	35.14.10		CARBON STEEL, STRAIGHT RUN									
			12 IN DIA, 3/8 IN STD	CONVEYOR PIPING	2,000.00 LF	-	-	198,400	3,172	93.09 /MH	295,320	493,720
			12 IN DIA, 3/8 IN STD	12" TIE IN PIPING TO BYPRODUCT SILO FROM THE EXISTING 50 TPH FLY ASH PRESSURE SYSTEM	1,500.00 LF	-	-	148,800	2,379	93.09 /MH	221,490	370,290
			CARBON STEEL, STRAIGHT RUN					347,200	5,552		516,810	864,010
			PIPING					347,200	5,552		516,810	864,010
			105 BYPRODUCT HANDLING SYSTEM			6,120,000	6,810,000	792,075	103,041		8,417,500	22,139,575
121			CIVIL BOP									
	21.00.00		CIVIL WORK									
		21.14.00	STRIP & STOCKPILE TOPSOIL									
			STRIP & STOCKPILE TOPSOIL - 12"		300,000.00 SF	-	-	-	690	185.95 /MH	128,241	128,241
			STRIP & STOCKPILE TOPSOIL - ONSITE		40,000.00 CY	-	-	-	5,287	185.95 /MH	983,184	983,184
			STRIP & STOCKPILE TOPSOIL - 12"	SITE GRADING	600,000.00 SF	-	-	-	1,379	185.95 /MH	256,483	256,483
			STRIP & STOCKPILE TOPSOIL - ONSITE	SITE GRADING	160,000.00 CY	-	-	-	21,149	185.95 /MH	3,932,736	3,932,736
			STRIP & STOCKPILE TOPSOIL						28,506		5,300,644	5,300,644
		21.17.00	EXCAVATION									
			EXCAVATION - EXCAVATION , BACKFILL & COMPACT EXCAVATION	ALL FOUNDATIONS	12,600.00 CY	-	-	-	4,345	84.40 /MH	366,703	366,703
			EXCAVATION						4,345		366,703	366,703
		21.39.00	STORM DRAINAGE UTILITIES									
			STORM SEWER WORK	SITE GRADING	1.00 LT	-	-	110,000	2,299	86.33 /MH	198,460	308,460
			STORM DRAINAGE UTILITIES					110,000	2,299		198,460	308,460
		21.41.00	EROSION AND SEDIMENTATION CONTROL									
			CRUSHED ROCK SURFACING, 12" DEEP WHITE ROCK		33,334.00 SY	-	-	355,007	1,149	103.37 /MH	118,818	473,826
			CRUSHED ROCK SURFACING, 12" DEEP WHITE ROCK	SITE GRADING	66,667.00 SY	-	-	710,004	2,299	103.37 /MH	237,633	947,637
			EROSION AND SEDIMENTATION CONTROL					1,065,011	3,448		356,452	1,421,462
		21.57.00	ROAD, PARKING AREA, & SURFACED AREA									
			ONSITE ROAD UPGRADES	ALLOWANCE	1.00 LS	-	-	700,000	3,483	86.08 /MH	299,796	999,796
			ROAD, PARKING AREA, & SURFACED AREA					700,000	3,483		299,796	999,796
		21.99.00	CIVIL WORK, MISCELLANEOUS									
			CIVIL WORK - CONSTRUCTION LAYDOWN AREAS	FENCING, POWER ETC...	10.00 AC	-	-	842,400	9,195	84.40 /MH	776,092	1,618,492

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Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Process Equipment Cost	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
			CIVIL WORK, MISCELLANEOUS					842,400	9,195		776,092	1,618,492
			CIVIL WORK					2,717,411	51,276		7,298,147	10,015,557
22.00.00			CONCRETE									
	22.13.00		CONCRETE									
			SLAB FOUNDATION LESS THAN 2 FT THICK, 4500 PSI, - COMPOSITE RATE	NEW WAREHOUSE BUILDING 200'X75'X15' TALL	555.00 CY	-	-	127,650	4,466	68.52 /MH	305,977	433,627
			CONCRETE FOUNDATIONS - COMPOSITE RATE	8' X 10' BYPRODUCT AREA, TRUCK SCALE HOUSE	6.00 CY	-	-	1,380	48	68.52 /MH	3,308	4,688
			CONCRETE					129,030	4,514		309,285	438,315
			CONCRETE					129,030	4,514		309,285	438,315
24.00.00			ARCHITECTURAL									
	24.35.00		PRE-ENGINEERED BUILDING									
			SHELL ONLY, STEEL UNINSULATED 22 GA, 200 FT X 75 FT x 15' TALL	NEW WAREHOUSE BUILDING 200'X75'X15' TALL	15,000.00 SF	-	-	420,000	5,862	98.30 /MH	576,241	996,241
			PRE-ENGINEERED BUILDING	8' X 10' BYPRODUCT AREA, TRUCK SCALE HOUSE	1.00 LT	-	-	10,000	115	98.30 /MH	11,299	21,299
			PRE-ENGINEERED BUILDING					430,000	5,977		587,540	1,017,540
	24.41.00		SIDING									
			INSULATION, 2 IN THICK FIBERGLASS,	NEW WAREHOUSE BUILDING 200'X75'X15' TALL	8,250.00 SF	-	-	9,900	95	87.92 /MH	8,337	18,237
			SIDING					9,900	95		8,337	18,237
			ARCHITECTURAL					439,900	6,072		595,877	1,035,777
27.00.00			PAINTING & COATING									
	27.17.00		PAINTING									
			PAINTING - ALLOWANCE	NEW WAREHOUSE BUILDING 200'X75'X15' TALL	15,000.00 SF	-	-	15,000	172	64.47 /MH	11,116	26,116
			PAINTING					15,000	172		11,116	26,116
			PAINTING & COATING					15,000	172		11,116	26,116
31.00.00			MECHANICAL EQUIPMENT									
	31.41.00		FIRE PROTECTION EQUIPMENT & SYSTEM									
			FIRE PROTECTION EQUIPMENT & SYSTEM	NEW WAREHOUSE BUILDING 200'X75'X15' TALL, FIRE PROTECTION ALLOWANCE	15,000.00 SF	-	-	82,500	1,155	75.53 /MH	87,250	169,750
			FIRE PROTECTION EQUIPMENT & SYSTEM					82,500	1,155		87,250	169,750
			MECHANICAL EQUIPMENT					82,500	1,155		87,250	169,750
34.00.00			HVAC									
	34.99.00		HVAC, MISCELLANEOUS									
			HVAC, MISCELLANEOUS - HVAC ALLOWANCE	NEW WAREHOUSE BUILDING 200'X75'X15' TALL	15,000.00 SF	-	-	165,000	172	73.32 /MH	12,641	177,641
			HVAC, MISCELLANEOUS					165,000	172		12,641	177,641
			HVAC					165,000	172		12,641	177,641
36.00.00			INSULATION									
	36.99.00		INSULATION, MISCELLANEOUS									
			INSULATION - ROOF INSULATION	NEW WAREHOUSE BUILDING 200'X75'X15' TALL	15,000.00 SF	-	-	18,000	172	58.15 /MH	10,026	28,026
			INSULATION, MISCELLANEOUS					18,000	172		10,026	28,026
			INSULATION					18,000	172		10,026	28,026
41.00.00			ELECTRICAL EQUIPMENT									
	41.37.00		LIGHTING ACCESSORY (FIXTURE)									
			LIGHTING ACCESSORY (FIXTURE) - ALLOWANCE	NEW WAREHOUSE BUILDING 200'X75'X15' TALL, LIGHTING ALLOWANCE	15,000.00 SF	-	-	165,000	172	69.31 /MH	11,950	176,950
			LIGHTING ACCESSORY (FIXTURE)					165,000	172		11,950	176,950
			ELECTRICAL EQUIPMENT					165,000	172		11,950	176,950
71.00.00			PROJECT INDIRECT									
	71.25.00		CONSULTANT, THIRD PARTY									
			CONSULTANT - SUBSURFACE INVESTIGATION		1.00 LS	200,000	-			/MH		200,000
			CONSULTANT - GEOTECHNICAL		1.00 LS	150,000	-			/MH		150,000

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Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Process Equipment Cost	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
			CONSULTANT, THIRD PARTY				350,000					350,000
			PROJECT INDIRECT				350,000					350,000
151			121 CIVIL BOP				350,000	3,731,841	63,706		8,336,292	12,418,133
	21.00.00		MECHANICAL BOP									
		21.54.00	CIVIL WORK									
			CAISSON									
			2.5 FT DIA X 30 FT DEEP CAISSON	TANK FOUNDATIONS	76.00 EA	-	-	141,132	1,922	115.48 /MH	221,934	363,066
			2.5 FT DIA X 30 FT DEEP CAISSON	COMMON PIPE RACK FOUNDATIONS	223.00 EA	-	-	414,111	5,639	115.48 /MH	651,201	1,065,312
			2.5 FT DIA X 30 FT DEEP CAISSON	BYPRODUCT PIPE RACK FOUNDATIONS	57.00 EA	-	-	105,849	1,441	115.48 /MH	166,450	272,299
			2.5 FT DIA X 30 FT DEEP CAISSON	REAGENT UNLOADING PIPE RACK FOUNDATIONS	32.00 EA	-	-	59,424	809	115.48 /MH	93,446	152,870
			CAISSON					720,516	9,811		1,133,031	1,853,547
			CIVIL WORK					720,516	9,811		1,133,031	1,853,547
	22.00.00		CONCRETE									
		22.13.00	CONCRETE									
			SPREAD FOOTING FOUNDATION, 4500 PSI - COMPOSITE RATE	3X 35' DIA TANK FDN	81.00 CY	-	-	18,630	652	68.52 /MH	44,656	63,286
			CONCRETE FOUNDATIONS - COMPOSITE RATE	COMMON PIPE RACK FOUNDATIONS	250.00 CY	-	-	57,500	2,011	68.52 /MH	137,828	195,328
			CONCRETE FOUNDATIONS - COMPOSITE RATE	BYPRODUCT PIPE RACK FOUNDATIONS	65.00 CY	-	-	14,950	523	68.52 /MH	35,835	50,785
			CONCRETE FOUNDATIONS - COMPOSITE RATE	REAGENT UNLOADING PIPE RACK FOUNDATIONS	36.00 CY	-	-	8,280	290	68.52 /MH	19,847	28,127
			CONCRETE					99,360	3,476		238,166	337,526
			CONCRETE					99,360	3,476		238,166	337,526
	23.00.00		STEEL									
		23.21.00	GIRDER									
			ROLLED SHAPE GIRDER - MEDIUM WEIGHT MEMBER 20# TO 40# / LF, 2 COAT PAINTED	COMMON 750'X20'W, 550'X15'W, ALL 20' HIGH	235.00 TN	-	-	636,850	4,592	98.30 /MH	451,389	1,088,239
			ROLLED SHAPE GIRDER - MEDIUM WEIGHT MEMBER 20# TO 40# / LF, 2 COAT PAINTED	BYPRODUCT PIPE RACK, 200'X12'W X 20' HIGH	24.00 TN	-	-	65,040	469	98.30 /MH	46,099	111,139
			ROLLED SHAPE GIRDER - MEDIUM WEIGHT MEMBER 20# TO 40# / LF, 2 COAT PAINTED	REAGENT UNLOADING PIPE RACK, 200'X6' WIDE X 20' HIGH	12.00 TN	-	-	32,520	234	98.30 /MH	23,050	55,570
			GIRDER					734,410	5,295		520,538	1,254,948
			STEEL					734,410	5,295		520,538	1,254,948
	31.00.00		MECHANICAL EQUIPMENT									
		31.17.00	COMPRESSOR & ACCESSORIES									
			AIR COMPRESSOR, CENTRIFUGAL - 250 SCFM EA @ 200 PSIG	SERVICE AIR	2.00 EA	-	310,000	-	92	75.53 /MH	6,945	316,945
			AIR COMPRESSOR, CENTRIFUGAL - 250 SCFM EA @ 200 PSIG	INSTRUMENT AIR	2.00 EA	-	310,000	-	92	75.53 /MH	6,945	316,945
			AIR DRYER - W/FILTERS, 250 NET SCFM EA	SERVICE AIR	2.00 EA	-	33,400	-	74	75.53 /MH	5,556	38,956
			AIR DRYER - W/FILTERS, 250 NET SCFM EA	INSTRUMENT AIR	2.00 EA	-	33,400	-	74	75.53 /MH	5,556	38,956
			AIR RECEIVER - 1,000 GALLON EA	SERVICE AIR	2.00 EA	-	11,200	-	37	75.53 /MH	2,778	13,978
			AIR RECEIVER - 1,000 GALLON EA	INSTRUMENT AIR	2.00 EA	-	11,200	-	37	75.53 /MH	2,778	13,978
			COMPRESSOR & ACCESSORIES					709,200	405		30,559	739,759
		31.41.00	FIRE PROTECTION EQUIPMENT & SYSTEM									
			DELUGE - POWER TRANSFORMERS		3.00 EA	-	-	127,500	1,959	93.09 /MH	182,328	309,828
			FIRE PROTECTION EQUIPMENT & SYSTEM					127,500	1,959		182,328	309,828
		31.65.00	HEAT EXCHANGER									
			HEAT EXCHANGER - SLAKER WATER HEATER 3" IN-LINE, 475 KW		4.00 EA	-	220,000	-	368	69.31 /MH	25,493	245,493
			HEAT EXCHANGER					220,000	368		25,493	245,493
		31.75.00	PUMP									
			CENTRIFUGAL, HORIZONTAL, SINGLE STAGE - MAKEUP WATER PUMPS, 2600 GPM, 200 TDH		2.00 EA	-	96,000	-	577	75.53 /MH	43,582	139,582
			CENTRIFUGAL, HORIZONTAL, SINGLE STAGE - RECYCLE ASH WATER PUMP, 50 HP		3.00 EA	-	72,000	-	221	75.53 /MH	16,669	88,669
			CENTRIFUGAL, HORIZONTAL, SINGLE STAGE - LIME SLAKING WATER PIUMPS, 50 HP		2.00 EA	-	48,000	-	147	75.53 /MH	11,112	59,112
			SUMP, CENTRIFUGAL, WET BEARING - REAGENT PREP/RECYCLE SUMP, 120GPM, 150 TDH		4.00 EA	-	220,000	-	276	75.53 /MH	20,836	240,836
			SUMP, CENTRIFUGAL, WET BEARING - LIME SILO & UNLOADING AREA SUMP 120 GPM @ 150 TDH		2.00 EA	-	88,000	-	138	75.53 /MH	10,418	98,418

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Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Process Equipment Cost	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
		31.75.00	PUMP									
			SUMP, CENTRIFUGAL, WET BEARING - WASTE ASH SILO AREA SUMP 120GPM @150 TDH		2.00 EA	-	88,000	-	138	75.53 /MH	10,418	98,418
			SUMP, CENTRIFUGAL, WET BEARING - WASTEWATER FORWARDING PUMP TO RECYCLED SLURRY, 100 GPM@150 TDH		4.00 EA	-	28,800	-	294	75.53 /MH	22,225	51,025
			SUMP, SUBMERSIBLE - RECYCLE ASH WATER TANK SUPPLY PUMP, 100 HP		2.00 EA	-	77,000	-	690	75.53 /MH	52,090	129,090
			PUMP				<u>717,800</u>		<u>2,480</u>		<u>187,349</u>	<u>905,149</u>
		31.83.00	TANK									
			ATMOSPHERIC, FIELD FABRICATED - LIME SLAKING WATER TANK, 175,000 GALLON	35' DIA X 24' HIGH	1.00 EA	220,000	-	-		94.32 /MH		220,000
			ATMOSPHERIC, FIELD FABRICATED - RECYCLE ASH WATER TANK, 200,000 GALLON	35' DIA X 30' HIGH	2.00 EA	500,000	-	-		94.32 /MH		500,000
			TANK			<u>720,000</u>						<u>720,000</u>
			MECHANICAL EQUIPMENT			<u>720,000</u>	<u>1,647,000</u>	<u>127,500</u>	<u>5,211</u>		<u>425,730</u>	<u>2,920,230</u>
	35.00.00		PIPING									
		35.13.01	SS 304, ABOVE GROUND, PROCESS AREA									
			1 IN DIA, SCH 40S		1,520.00 LF	-	-	32,832	1,974	93.09 /MH	183,783	216,615
			1.5 IN DIA, SCH 40S		1,380.00 LF	-	-	52,302	2,094	93.09 /MH	194,911	247,213
			2 IN DIA, SCH 40S		2,070.00 LF	-	-	113,022	3,426	93.09 /MH	318,946	431,968
			SS 304, ABOVE GROUND, PROCESS AREA					<u>198,156</u>	<u>7,494</u>		<u>697,640</u>	<u>895,796</u>
		35.13.10	CARBON STEEL, ABOVE GROUND, PROCESS AREA									
			1 IN DIA, SCH 80		260.00 LF	-	-	2,314	305	93.09 /MH	28,376	30,690
			2 IN DIA, SCH 80		2,260.00 LF	-	-	48,138	3,273	93.09 /MH	304,693	352,831
			2.5 IN DIA, SCH 40		1,000.00 LF	-	-	15,400	1,437	93.09 /MH	133,750	149,150
			3 IN DIA, SCH 40		7,160.00 LF	-	-	125,300	11,028	93.09 /MH	1,026,601	1,151,901
			3 IN DIA, SCH 80		1,760.00 LF	-	-	38,720	3,055	93.09 /MH	284,363	323,083
			4 IN DIA, SCH 40		1,000.00 LF	-	-	22,600	1,701	93.09 /MH	158,360	180,960
			6 IN DIA, SCH 40		880.00 LF	-	-	28,248	1,629	93.09 /MH	151,598	179,846
			6 IN DIA, SCH 40 VACUUM PIPE		2,260.00 LF	-	-	72,546	4,182	93.09 /MH	389,330	461,876
			8 IN DIA, SCH 80		3,520.00 LF	-	-	256,608	9,832	93.09 /MH	915,235	1,171,843
			CARBON STEEL, ABOVE GROUND, PROCESS AREA					<u>609,874</u>	<u>36,441</u>		<u>3,392,307</u>	<u>4,002,181</u>
		35.14.10	CARBON STEEL, STRAIGHT RUN									
			6 IN DIA, SCH 40, LIME SLAKING TANK MAKEUP	LIME SLAKING TANK MAKEUP	1,200.00 LF	-	-	27,480	1,214	93.09 /MH	112,992	140,472
			8 IN DIA, SCH 40, LIME SLAKING TANK MAKEUP	LIME SLAKING TANK MAKEUP	450.00 LF	-	-	13,905	486	93.09 /MH	45,261	59,166
			8 IN DIA, SCH 40, RECYCLE ASH WATER PIPING	RECYCLE ASH WATER PIPING	2,000.00 LF	-	-	61,800	2,161	93.09 /MH	201,160	262,960
			10 IN DIA, SCH 40, RECYCLE ASH TANK MAKEUP	RECYCLE ASH TANK MAKEUP	450.00 LF	-	-	24,660	610	93.09 /MH	56,817	81,477
			CARBON STEEL, STRAIGHT RUN					<u>127,845</u>	<u>4,471</u>		<u>416,230</u>	<u>544,075</u>
		35.15.10	CARBON STEEL, BURIED									
			3 IN DIA, SCH 40, WRAPPED		3,000.00 LF	-	-	51,000	2,241	93.09 /MH	208,650	259,650
			6 IN DIA, SCH 40, WRAPPED		750.00 LF	-	-	23,925	776	93.09 /MH	72,225	96,150
			10 IN DIA, SCH 40, WRAPPED, RECYCLE ASH WATER PIPE DISCHARGE BURIED	RECYCLE ASH WATER PIPE DISCHARGE BURIED	1,800.00 LF	-	-	119,700	2,441	93.09 /MH	227,268	346,968
			CARBON STEEL, BURIED					<u>194,625</u>	<u>5,459</u>		<u>508,143</u>	<u>702,768</u>
		35.15.25	FRP, BURIED									
			3 IN DIA, TAPER		1,000.00 LF	-	-	14,800	460	93.09 /MH	42,800	57,600
			3 IN DIA, TAPER FRP/HDPE PIPE		2,380.00 LF	-	-	35,224	1,094	93.09 /MH	101,864	137,088
			FRP, BURIED					<u>50,024</u>	<u>1,554</u>		<u>144,664</u>	<u>194,688</u>
		35.15.30	HDPE, BURIED									
			6 IN DIA, DR 9		1,430.00 LF	-	-	12,870	1,134	93.09 /MH	105,577	118,447
			8 IN DIA, DR 9		1,340.00 LF	-	-	20,770	1,278	93.09 /MH	119,005	139,775
			HDPE, BURIED					<u>33,640</u>	<u>2,413</u>		<u>224,582</u>	<u>258,222</u>
		35.36.00	PIPE SUPPORTS, RACK									
			SUPPORT SLEEPERS	BYPRODUCT PIPE, 1750LF	125.00 EA	-	-	43,750	575	93.09 /MH	53,500	97,250
			SUPPORT SLEEPERS	REAGENT UNLOADING PIPE, 1500LF	108.00 EA	-	-	37,800	497	93.09 /MH	46,224	84,024
			PIPE SUPPORTS, RACK					<u>81,550</u>	<u>1,071</u>		<u>99,724</u>	<u>181,274</u>
		35.45.00	VALVES									

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Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Process Equipment Cost	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
		35.45.00	VALVES									
			VALVE - 36" 150 LB CS BUTTERFLY, FLANGED		2.00 EA	-	-	79,920	96	93.09 /MH	8,902	88,822
			VALVE - 12" 150 LB CS KNIFE GATE, FLANGED		6.00 EA	-	-	20,160	195	93.09 /MH	18,169	38,329
			VALVE - 12" 150 LB CS GATE VALVE, FLANGED		2.00 EA	-	-	8,920	65	93.09 /MH	6,056	14,976
			VALVE - 10" 150 LB CS SWING CHECK, FLANGED		2.00 EA	-	-	9,200	55	93.09 /MH	5,136	14,336
			VALVE - 10" 150 LB CS BUTTERFLY, FLANGED		5.00 EA	-	-	22,200	138	93.09 /MH	12,840	35,040
			VALVE - 8" 150 LB CS GATE, FLANGED		20.00 EA	-	-	100,000	425	93.09 /MH	39,590	139,590
			VALVE - 6" 150 LB CS GATE, FLANGED		6.00 EA	-	-	19,800	110	93.09 /MH	10,272	30,072
			VALVE - 6" 150 LB CS AIR OPERATED GATE, FLANGED		4.00 EA	-	-	20,400	74	93.09 /MH	6,848	27,248
			VALVE - 6" 150 LB CS AIR OPERATED GLOBE, FLANGED		4.00 EA	-	-	20,400	74	93.09 /MH	6,848	27,248
			VALVE - 6" 150 LB CS SWING CHECK, FLANGED		2.00 EA	-	-	3,400	37	93.09 /MH	3,424	6,824
			VALVE - 4" 150 LB CS GATE, FLANGED		3.00 EA	-	-	3,825	25	93.09 /MH	2,311	6,136
			VALVE - 3" AND BELOW CS FOR SERVICE WATER ISOLATION		120.00 EA	-	-	1,224,000	1,076	93.09 /MH	100,152	1,324,152
			VALVE - 3" AND BELOW CS FOR SERVICE AIR ISOLATION		120.00 EA	-	-	1,224,000	1,076	93.09 /MH	100,152	1,324,152
			VALVE - 3" 150 LB CS GATE, FLANGED		20.00 EA	-	-	15,000	179	93.09 /MH	16,692	31,692
			VALVE - 3" CS PST IND FOR FP 250 LB		6.00 EA	-	-	6,600	54	93.09 /MH	5,008	11,608
			VALVE - 2" AND ABOVE BRONZE VALVES FOR INSTRUMENT AIR ISOLATION		600.00 EA	-	-	78,000	501	93.09 /MH	46,673	124,673
			VALVE - 1" CS FLANGED		4.00 EA	-	-	880	21	93.09 /MH	1,969	2,849
			VALVE - 6" CI POST INDICATOR 250 LB., MECHANICAL JOINT WITH BOXES BURIED VALVE		6.00 EA	-	-	4,080	28	93.09 /MH	2,568	6,648
			VALVES					2,860,785	4,228		393,610	3,254,395
			PIPING					4,156,499	63,131		5,876,900	10,033,399
	36.00.00		INSULATION									
		36.17.01	PIPE, CALCIUM SILICATE W/ALUMINUM JACKETING									
			CALCIUM SILICATE W/ALUMINUM JACKETING - 8" PIPE 1.5" THICK		2,520.00 LF	-	-	16,380	487	73.69 /MH	35,859	52,239
			1" CALCIUM SILICATE W/ALUMINUM JACKETING - 3" PIPE		1,260.00 LF	-	-	3,591	155	73.69 /MH	11,419	15,010
			1" CALCIUM SILICATE W/ALUMINUM JACKETING - 3" PIPE		5,660.00 LF	-	-	16,131	696	73.69 /MH	51,297	67,428
			1" CALCIUM SILICATE W/ALUMINUM JACKETING - 2.5" PIPE		380.00 LS	-	-	1,083	47	73.69 /MH	3,444	4,527
			1" CALCIUM SILICATE W/ALUMINUM JACKETING - 2.0" PIPE		4,140.00 LS	-	-	10,309	476	73.69 /MH	35,066	45,375
			PIPE, CALCIUM SILICATE W/ALUMINUM JACKETING					47,494	1,860		137,085	184,579
			INSULATION					47,494	1,860		137,085	184,579
	41.00.00		ELECTRICAL EQUIPMENT									
		41.33.00	HEAT TRACING									
			HEAT TRACING - 8" PIPE		2,520.00 LS	-	-	18,749	43	69.31 /MH	3,011	21,760
			HEAT TRACING - 3" PIPE		1,260.00 LF	-	-	9,374	22	69.31 /MH	1,506	10,880
			HEAT TRACING - 3" PIPE		5,660.00 LF	-	-	42,110	98	69.31 /MH	6,764	48,874
			HEAT TRACING - 2.5" PIPE		380.00 LS	-	-	2,827	7	69.31 /MH	454	3,281
			HEAT TRACING - 2.0" PIPE		440.00 LS	-	-	3,274	8	69.31 /MH	526	3,799
			HEAT TRACING					76,334	177		12,261	88,595
			ELECTRICAL EQUIPMENT					76,334	177		12,261	88,595
			151 MECHANICAL BOP			720,000	1,647,000	5,962,113	88,963		8,343,711	16,672,824
190			DEMOLITION / RELOCATION									
	11.00.00		DEMOLITION									
		11.99.00	DEMOLITION, MISCELLANEOUS									
			DEMOLITION - MISC	ALLOWANCE	1.00 LT	-	-	1,800,000	33,333	98.30 /MH	3,276,667	5,076,667
			DEMOLITION, MISCELLANEOUS					1,800,000	33,333		3,276,667	5,076,667
			DEMOLITION					1,800,000	33,333		3,276,667	5,076,667
			190 DEMOLITION / RELOCATION					1,800,000	33,333		3,276,667	5,076,667
201			ELECTRICAL BOP SYSTEM									
	41.00.00		ELECTRICAL EQUIPMENT									
		41.99.00	ELECTRICAL EQUIPMENT, MISCELLANEOUS									
			ELECTRICAL EQUIPMENT AND MISCELLANEOUS COMPONENTS	ALLOWANCE	1.00 LT	-	12,300,000	1,600,000	88,322	69.31 /MH	6,121,587	20,021,587
			ELECTRICAL COMMODITIES - CABLE	ALLOWANCE	1.00 LT	-	-	8,500,000	88,391	84.60 /MH	7,477,862	15,977,862
			ELECTRICAL COMMODITIES - CONDUITS, RACEWAY, ETC.	ALLOWANCE	1.00 LT	-	-	1,400,000	107,471	84.60 /MH	9,092,069	10,492,069
			ELECTRICAL EQUIPMENT, MISCELLANEOUS					12,300,000	11,500,000	284,184	22,691,518	46,491,518
			ELECTRICAL EQUIPMENT					12,300,000	11,500,000	284,184	22,691,518	46,491,518

ENTERGY ARKANSAS
 INDEPENDENCE STATION DRY (SDA) FGD
 CONCEPTUAL COST ESTIMATE



Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Process Equipment Cost	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
211			201 ELECTRICAL BOP SYSTEM				12,300,000	11,500,000	284,184		22,691,518	46,491,518
			INSTRUMENTATION AND CONTROLS BOP SYSTEM									
	44.00.00		CONTROL & INSTRUMENTATION									
		44.99.00	CONTROL & INSTRUMENTATION, MISCELLANEOUS									
			CONTROL & INSTRUMENTATION - MISC	ALLOWANCE	1.00 LT	-	1,500,000	1,085,000	10,920	72.29 /MH	789,374	3,374,374
			CONTROL & INSTRUMENTATION, MISCELLANEOUS				1,500,000	1,085,000	10,920		789,374	3,374,374
			CONTROL & INSTRUMENTATION				1,500,000	1,085,000	10,920		789,374	3,374,374
			211 INSTRUMENTATION AND CONTROLS BOP SYSTEM				1,500,000	1,085,000	10,920		789,374	3,374,374